387

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

The PHOTOFACT Servicer

Vol. 39
Set 387

★ *Published for all users of Howard W. Sams' Photofact Folders* ★ Jan. 1, 1958

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

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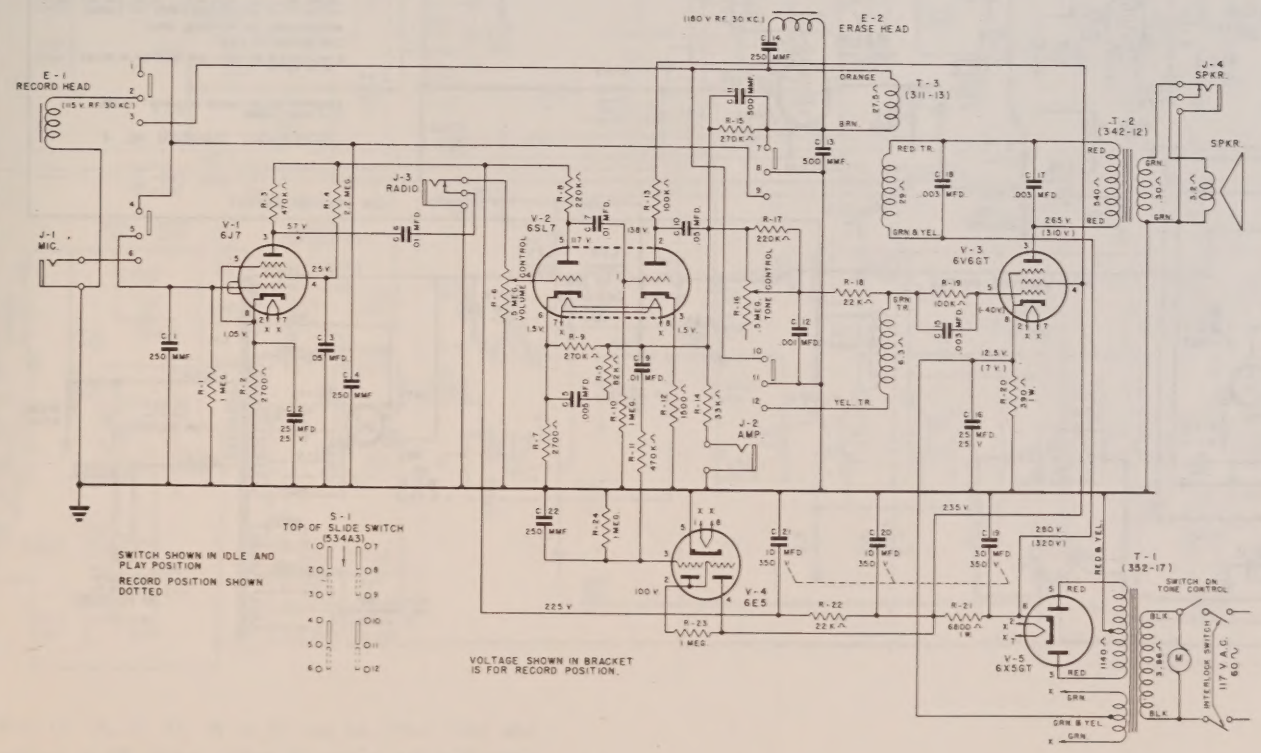
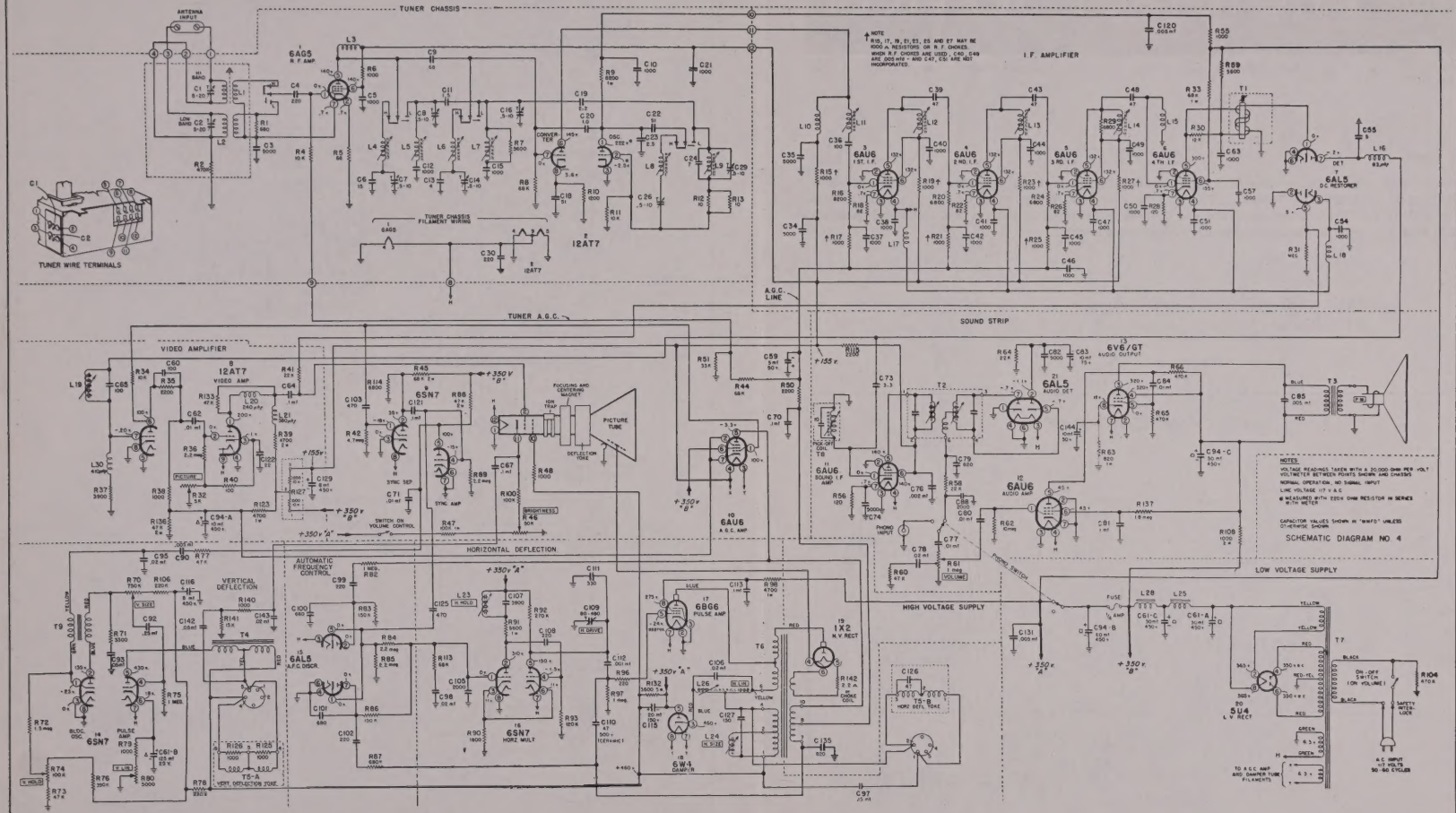
Airline Model 25GSG-3682B



Schematic Diagram Courtesy of Montgomery Ward & Co.

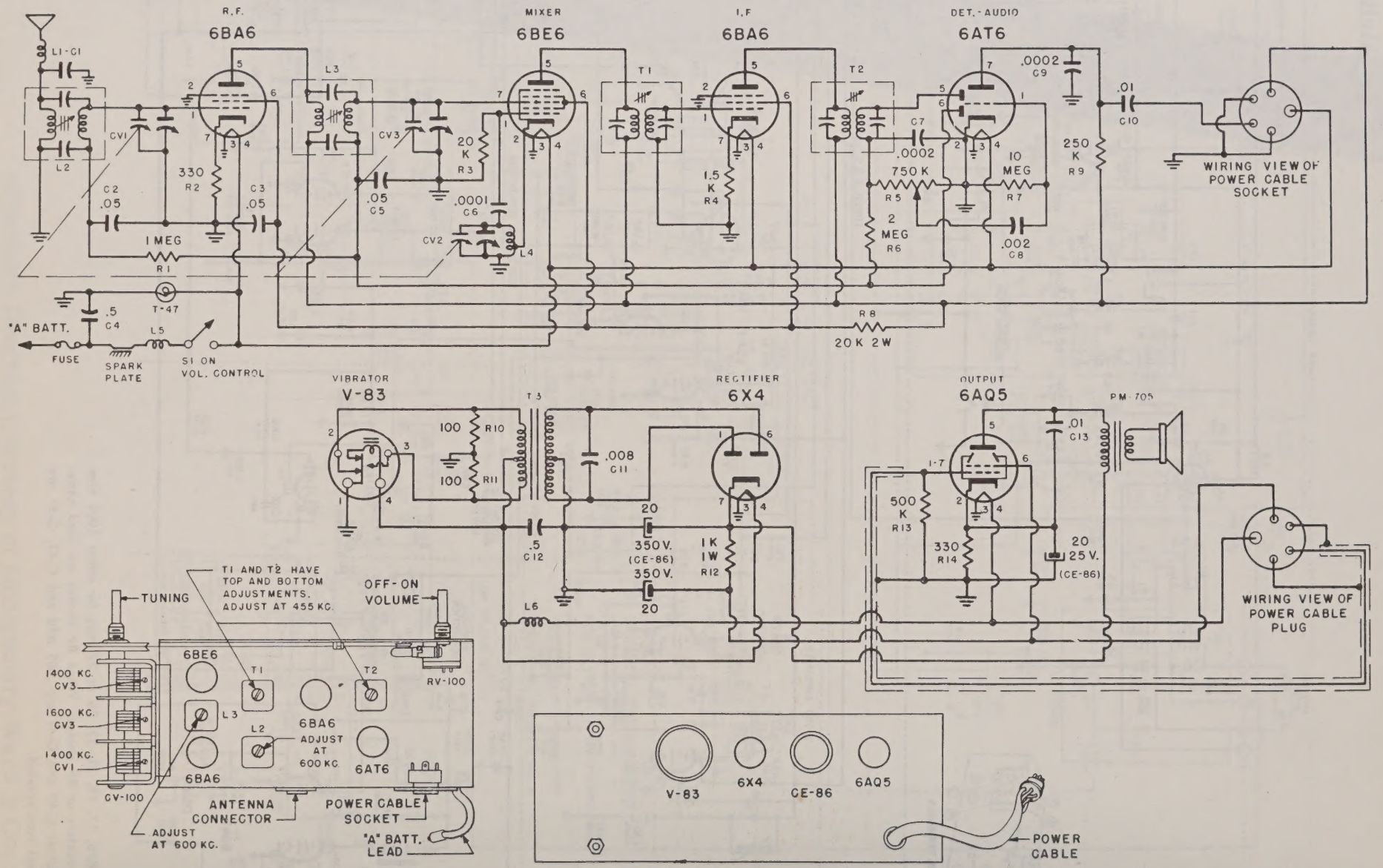
Airline Model 15BR-3048A



† NOTE: R15, 17, 19, 21, 23, 25 or 27 may be either 1000 ohm resistors or RF chokes. When RF chokes are used capacitors C-40 and C-49 are .005 mfd and C-47, C-51 are not incorporated.

Schematic Diagram Courtesy of Montgomery Ward & Co.

Aircastle Model 610. H-451



Schematic Diagram Courtesy of Spiegel, Inc.

PHOTOFACT* Folder
*TRADE MARK

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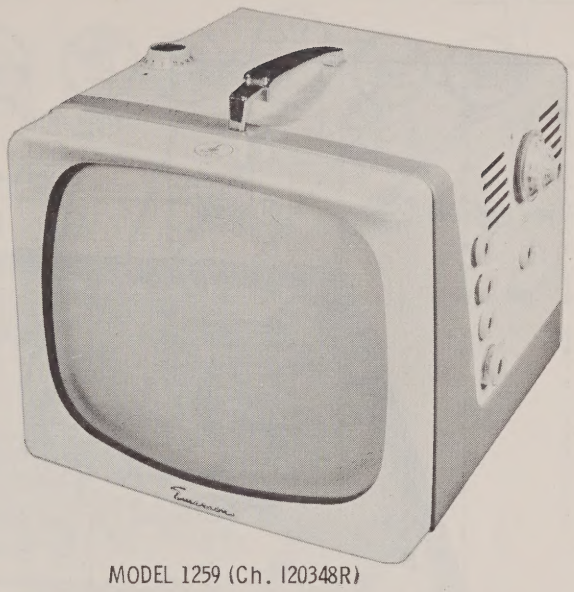
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 push-on type knobs from the side and 1 from the top.
2. Remove 3 metal screws from the rear cover and remove the rear cover.
3. Remove the speaker leads, picture tube socket, ion trap, yoke clamp and HV lead.
4. Remove 1 metal screw from the top, by the radio tuning shaft.
5. Remove 2 hex nuts and the speaker.
6. Remove 1 metal screw from the top chassis brace.
7. Remove 4 chassis bolts from the bottom.
8. Remove the chassis and yoke.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.



MODEL 1259 (Ch. 120348R)

EMERSON MODELS 1254, 1255, 1258, 1259, 1264, 1265, 1268, 1269, 2064, 2065 (Ch. 120341H, 120342R, 120347H, 120348R, 120358H, 120359R)

TRADE NAME	Emerson	MODELS	CHASSIS
		1254, 1264	120341H
		1255, 1265	120342R
		1258, 1268	120347H
		1259, 1269	120348R
		2064	120358H
		2065	120359R
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th. & Coles Sts., Jersey City 2, N.J.		
TYPE SET	Combination Radio, Phono, TV Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATINGS	TV 110 Watts, 1.1 Amp. @ 117 Volts AC Radio 100 Watts, .9 Amp. @ 117 Volts AC Phono 90 Watts, .8 Amp. @ 117 Volts AC
TUNING RANGE	TV Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier) Radio 540KC-1638KC, IF 455KC		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from the bottom of the front. Pull the bottom of the front out and up to remove.

SPECIAL ADJUSTMENTS

A. Focus
Adjust the ion trap for the best focus consistent with maximum brightness.

B. Width
The width may be varied by means of a metallic sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A8) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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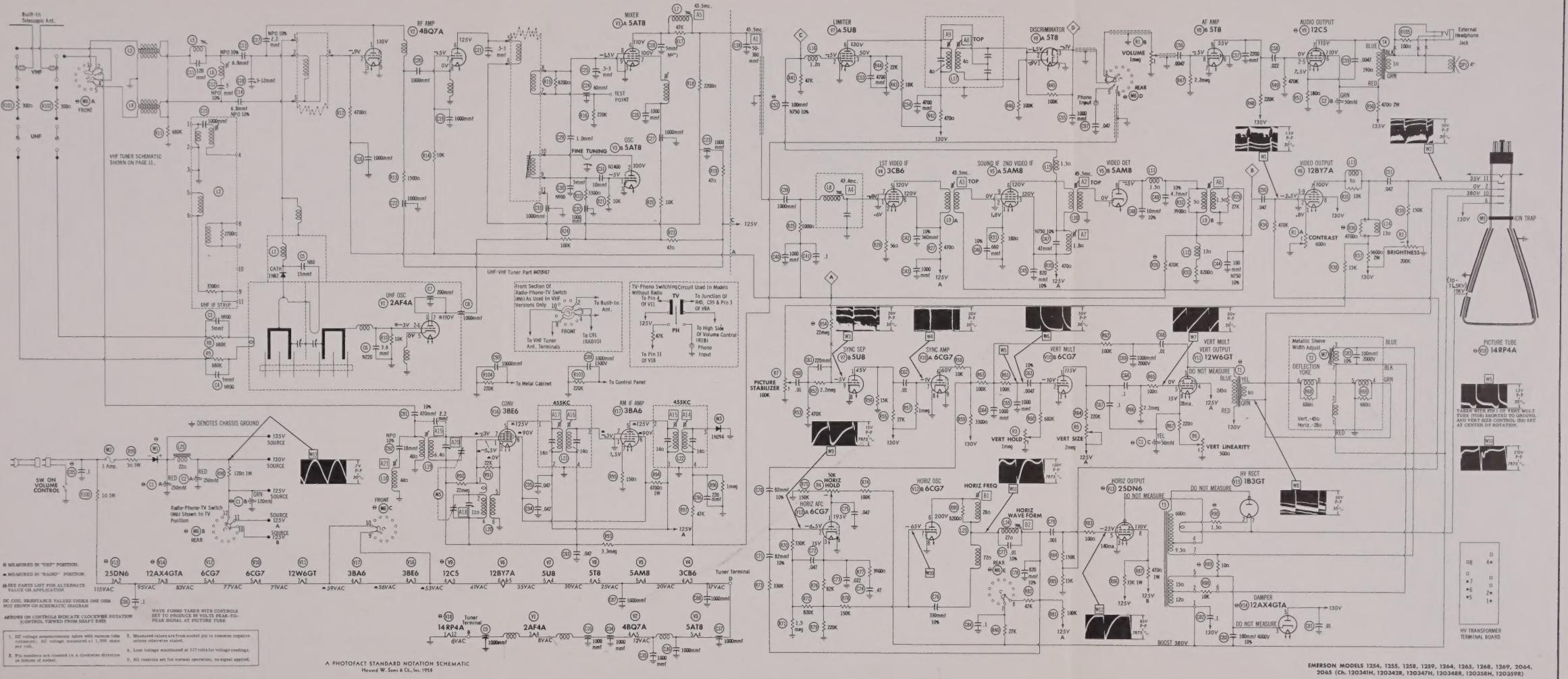
Built-In Telescopic Ant.
VHF
UHF
VHF TUNER SCHEMATIC SHOWN ON PAGE 11.
RF AMP V2 4BQ7A
MIXER V3A 5AT8
OSC V3B 5AT8
FINE TUNING
TEST POINT
UHF-VHF Tuner Part #470987
UHF OSC V1 2AF4A
UHF I.F. STRIP
CONV V1B 3BE6
455KC
AM I.F. AMP V17 3BA6
455KC
LIMITER V7A 5U8
DISCRIMINATOR V10A 5T8
VOLUME 1meg
REAR
AF AMP V8B 5T8
AUDIO OUTPUT V9 12C5
External Headphone Jack
1ST VIDEO I.F. V4 3CB6
SOUND I.F. 2ND VIDEO I.F. V5A 5AM8
VIDEO DET V5B 5AM8
VIDEO OUTPUT V6 12BY7A
CONTRAST 500Ω
BRIGHTNESS 200K
ION TRAP
PICTURE TUBE V18 14RP4A
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
Radio-Phono-TV Switch (M6) Shown In TV Position
Front Section Of Radio-Phono-TV Switch (M6) As Used In VHF Versions Only
To Built-In Ant.
To VHF Tuner Ant. Terminals
To C91 (RADIO)
TV-Phono Switching Circuit Used In Models Without Radio
To Junction Of R45, C35 & Pin 3 Of V8A
To High Side Of Volume Control (R18)
To Pin 11 Of V1B
To Pin 4 Of V11
To Phono Input
To Metal Cabinet
To Control Panel
SYNC SEP V9 5U8
SYNC AMP V10A 6CG7
VERT MULT V10B 6CG7
VERT MULT V11 12W6GT
VERT OUTPUT V11 12W6GT
DO NOT MEASURE
PICTURE STABILIZER 100K
VERT HOLD 1meg
VERT SIZE 2meg
VERT LINEARITY 500Ω
Metallic Sleeve Width Adjust
DEFLECTION YOKE
Vert.-40Ω
Horiz.-28Ω
HORIZ OSC V12B 6CG7
HORIZ AFC V12A 6CG7
50K HORIZ HOLD
HORIZ FREQ
HORIZ WAVE FORM
HORIZ OUTPUT V13 25DN6
HV RECT V13 1B3GT
DAMPER V14 12AX4GTA
BOOST 380V
HV TRANSFORMER TERMINAL BOARD
Tuner Terminal
14RP4A
2AF4A
4BQ7A
5AT8
115VAC
95VAC
83VAC
77VAC
71VAC
59VAC
56VAC
53VAC
41VAC
35VAC
30VAC
25VAC
20VAC
17VAC
6VAC
8VAC
12VAC
25DN6 7A2
12AX4GTA 7A8
6CG7 5A4
6CG7 5A4
12W6GT 7A2
3BA6 4A3
3BE6 6A8
12C5 4A2
12BY7A 6AR5
5U8 5A4
5T8 5A5
5AM8 5A4
3CB6 4A3
1N294
1N2071
1N2 CATH
1N400
1N60
N920
N750
N1500
N330
N150
N680
N900
M6 A FRONT
M6 B REAR
M6 C FRONT
M6 D REAR
M6 FRONT
M6 REAR
M1 1 Amp. 50 SW
M2
M3
M4
M5
M7
M8
M9
M10
M11
M12
M13
M14
M15
M16
M17
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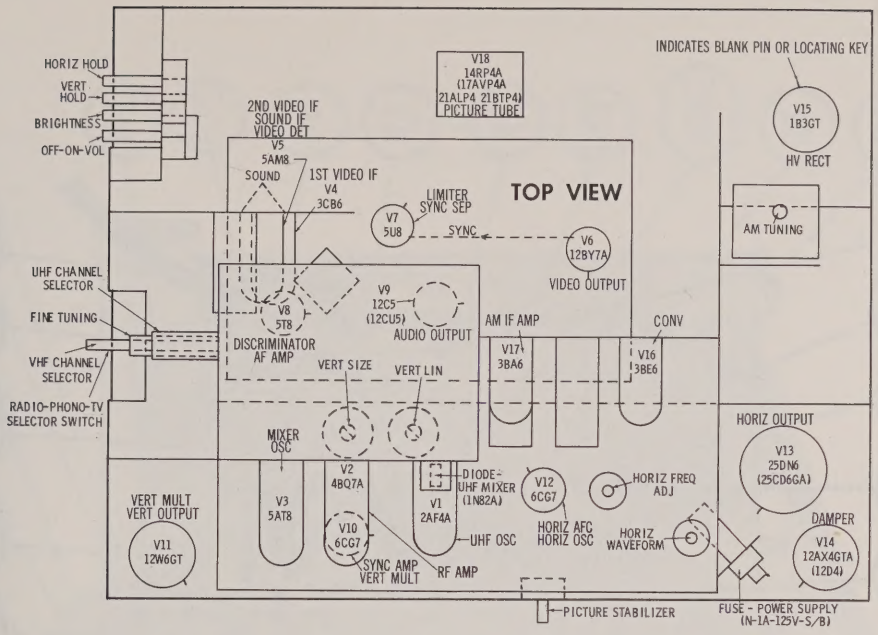
M44
M45
M46

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

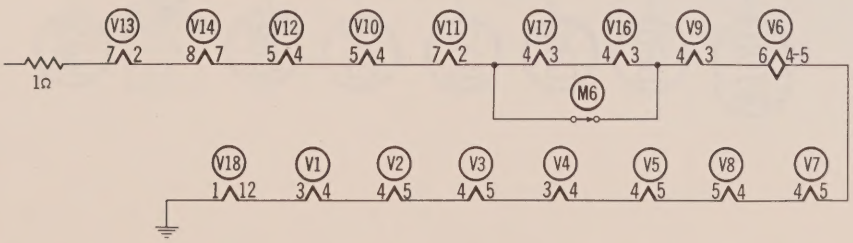
POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M2), Rectifier (M1)**

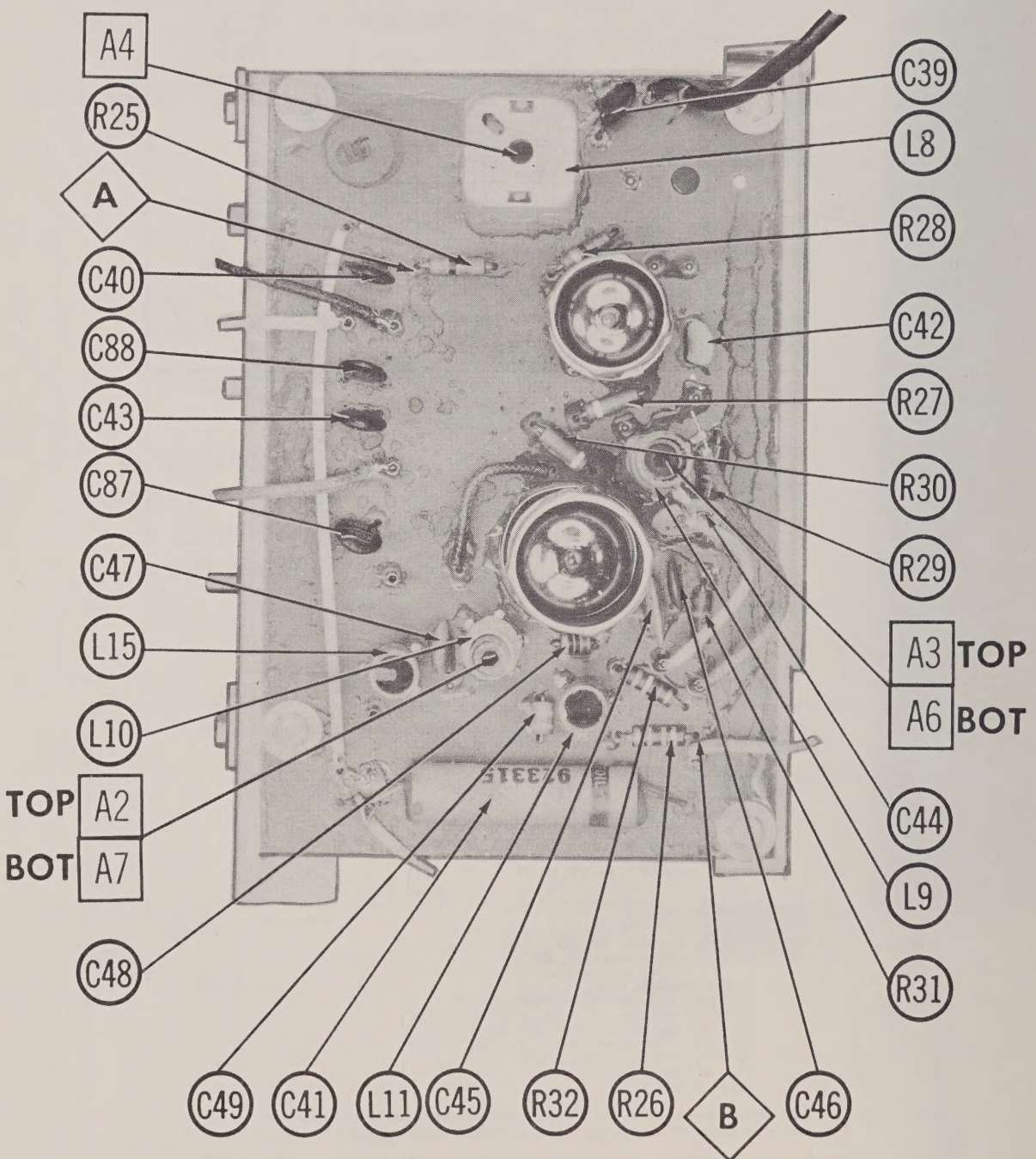
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V4, V5**
No pic, no sound, has snow - **V2, V3 (V1 UHF only)**
No pic, has sound, has raster - **V6, V18**
Has pic, no sound - **V5, V7, V8, V9**

SYNC FAILURE
No vert. sync - **V7, V10**
No horiz. sync - **V7, V10, V12**
No vert. or horiz. sync - **V7, V10**

SWEEP FAILURE
No raster, has sound - **V12, V13, V14, V15, V18**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover -**V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V12**

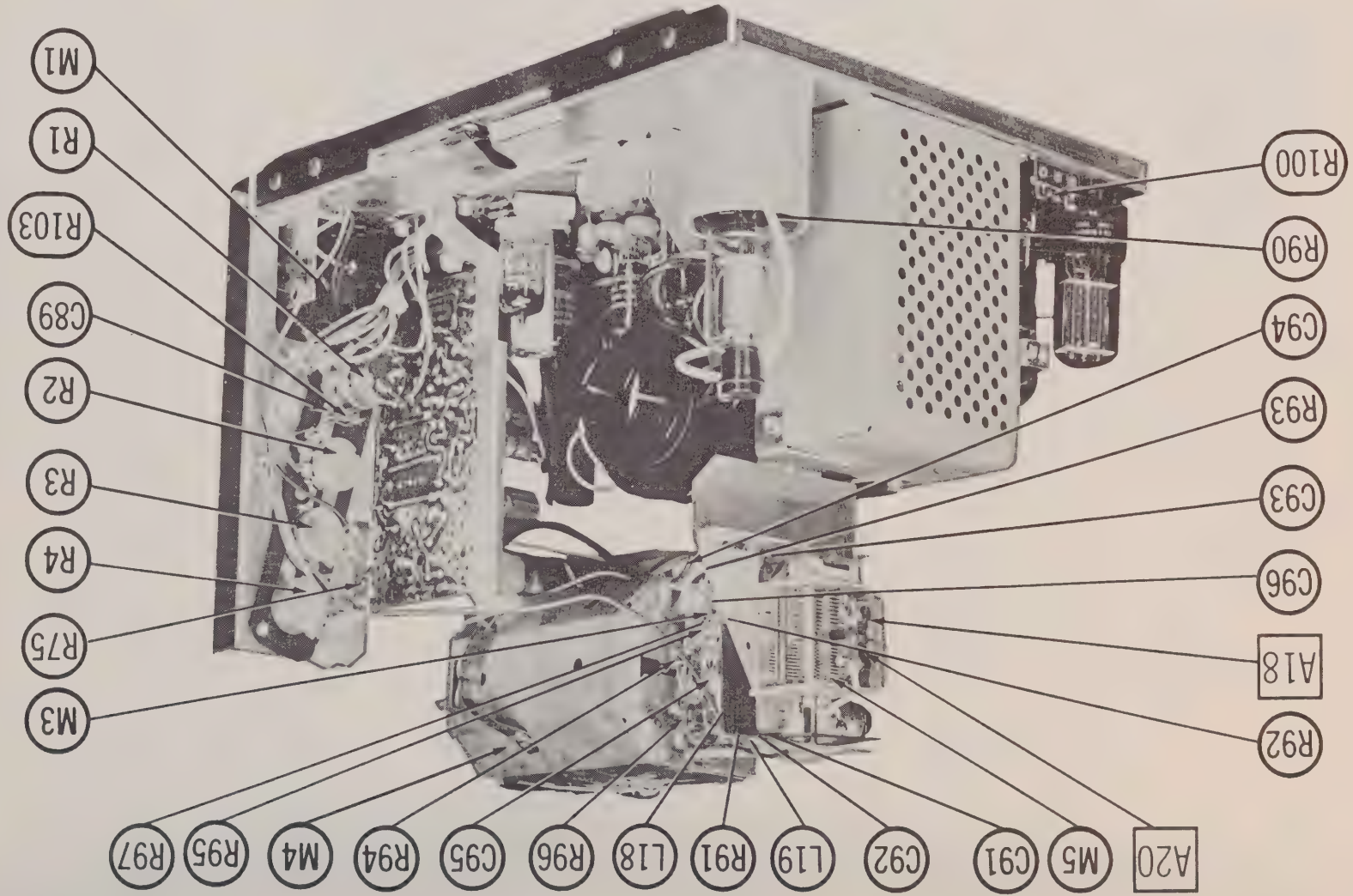
This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





VIDEO IF PRINTED BOARD

CHASSIS FRONT VIEW



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V3). Low side to chassis.	Not used	45.5MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe to point Ⓑ Common to chassis.	A1, A2	Preset A1 fully clockwise. Use only enough generator output to provide a usable indication on VTVM. Adjust A2 for maximum deflection on VTVM.
2.	"	"	"	43.5MC	"	"	A3, A4, A5	Use only enough generator output to provide a usable indication on VTVM.
3.	"	"	44.0MC (10MC Swp)	45.75MC	"	Vert. Amp. thru 10K to point Ⓑ . Low side to chassis.		Use only enough sweep generator output to provide a usable pattern on scope. Check for response similar to Fig. 1. Adjust A1 to place marker at 40% on curve. A1 also affects bandwidth which should be about 3MC.

SOUND IF ALIGNMENT

1. Loosely couple the antenna to the antenna terminals of the receiver and tune in a weak TV signal.
2. Connect the DC probe of the VTVM to point Ⓒ . Common to chassis.
3. Adjust A6 and A7 for maximum negative reading on the VTVM.
4. Move the DC probe to point Ⓓ . Detune A8 for maximum negative reading on the VTVM.
5. Adjust A9 for maximum negative reading on the VTVM.
6. Readjust A8 toward original position of slug for MINIMUM voltage reading on the VTVM. Check the audio, if distorted, repeat steps 1 thru 6.

VHF OSCILLATOR ALIGNMENT FOR TUNER #470980

Channel 13 oscillator adjustment slug (A10) is also used for adjusting the other high band (12 thru 7) channels. Channel 6 oscillator adjustment slug (A11) is also adjusted for channel 5. Channel 4 oscillator adjustment (A12) is also adjusted for channel 3. Channel 2 oscillator slug (A13) is used only for channel 2.
Turn the set on and tune in the highest high band channel operating in the area and adjust controls for normal operation. Set fine tuning to the center of its range. Adjust A10 for best picture and sound. Switch to next high band channel. If necessary to adjust, do so by bending coil loop appearing at the hole to left of tuner shaft for best picture and sound.
Switch channel selector to the highest low band channel (6 thru 2) operating in the area. Adjust proper slug for best picture and sound. If channel 5 or 3 needs adjusting, it will be necessary to switch to the next higher channel, adjust slug SLIGHTLY, then switch back to the channel needing adjustment and check picture. Repeat until proper results are obtained. Repeat procedure until all channels operating in the area have been properly adjusted.

VHF OSCILLATOR ALIGNMENT FOR TUNER #470987

Adjustment of the oscillator may be accomplished by adjustment slugs, accessible one at a time thru a hole in the front of the tuner chassis as the receiver is switched to each channel. Set the fine tuning to the center of its range and adjust the oscillator slug for best picture and sound.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

RADIO ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	.05mfd	High side to AM antenna stator lug on tuning gang. Low side to chassis.	455KC (400~ Mod)	Radio	Tuning gang fully open	Across voice coil	A14, A15, A16, A17	Adjust for maximum output.
5.		Loop	1638KC	"	"	"	A18	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
6.		"	600KC	"	600KC	"	A19	"
7.		"	1425KC	"	Tune to 1425KC signal	"	A20	"
8.		"	455KC	"	Tuning gang fully open	"	A21	Adjust for MINIMUM output.

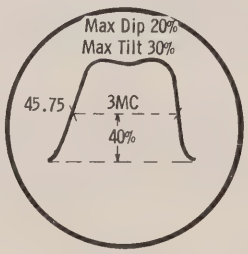
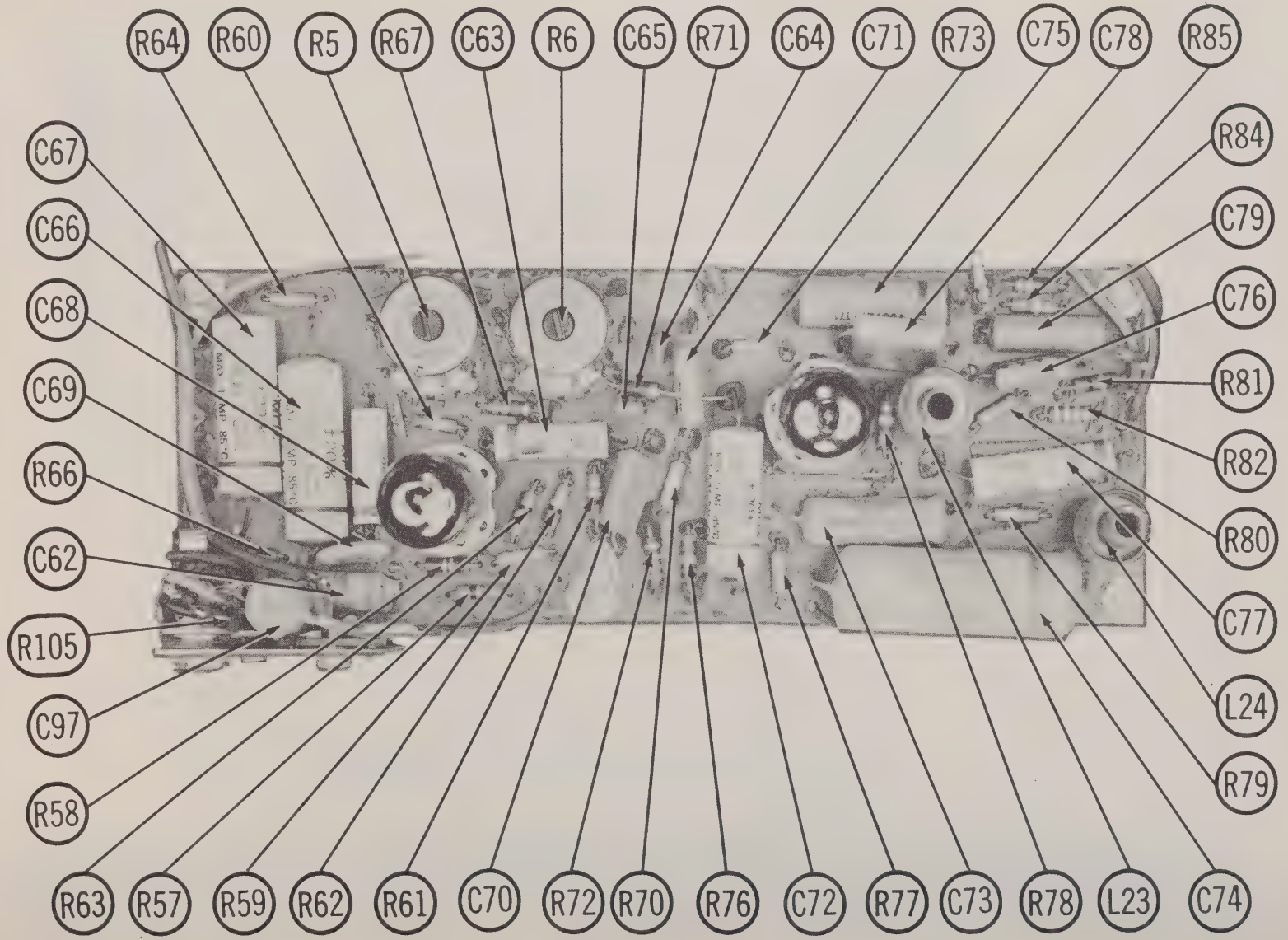


FIG. 1

CHASSIS REAR VIEW



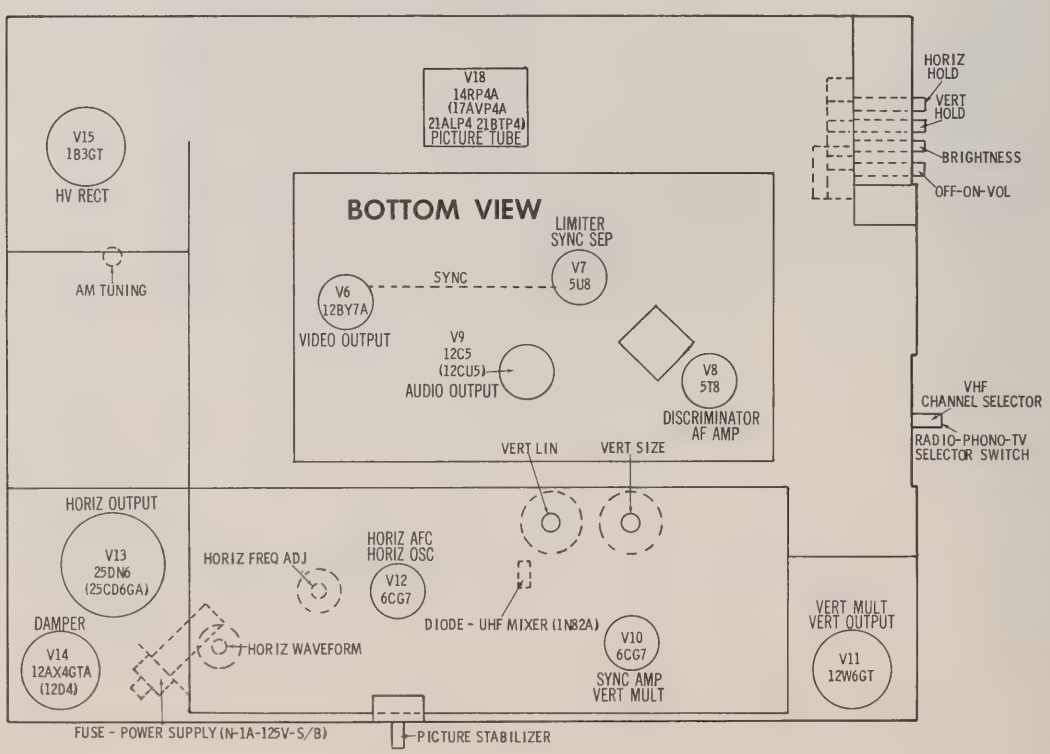
SWEEP PRINTED BOARD

VIDEO, SYNC, & SOUND PRINTED BOARD

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2AF4A	†*3450Ω	10K	1.5Ω	2Ω	.1Ω	10K	†*3450Ω		
V2	4BQ7A	†1600Ω	480K	0Ω	2Ω	3Ω	†165Ω	490K	0Ω	0Ω
V3	5AT8	10K	†3400Ω	0Ω	4Ω	3Ω	†2300Ω	†10K	0Ω	220K
V4	3CB6	480K	56Ω	4Ω	5Ω	†590Ω	†590Ω	0Ω		
V5	5AM8	180Ω	1.6Ω	†590Ω	5Ω	6Ω	†590Ω	.1Ω	8200Ω	0Ω
V6	12BY7A	•95Ω	485K	0Ω	9.5Ω	9.5Ω	11Ω	†5600Ω	†22Ω	0Ω
V7	5U8	†14K	47K	†11K	7Ω	9.5Ω	†490Ω	0Ω	0Ω	2.6meg
V8	5T8	100K	100K	150K	7Ω	6Ω	0Ω	0Ω	2.2meg	†220K
V9	12C5	180Ω	470K	11Ω	13.5Ω	470K	†470Ω	†660Ω		
V10	6CG7	•†900K	•950K	0Ω	18Ω	20Ω	†13K	†1meg	0Ω	0Ω
V11	12W6GT	NC	14.5Ω	†267Ω	†140Ω	2.2meg	TP	16Ω	•360Ω	
V12	6CG7	•‡90K	900K	270K	16Ω	18Ω	†70K	320K	0Ω	0Ω
V13	25DN6	NC	23Ω	0Ω	TP	160K	TP	28Ω	†590Ω	TOP CAP ‡20Ω
V14	12AX4GTA	NC	NC	¶	NC	†140Ω	NC	23Ω	20Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡620Ω
V16	3BE6	▲22K	▲.7Ω	▲13.5Ω	▲4Ω	▲†155Ω	▲†4800Ω	▲3.8meg		
V17	3BA6	▲3.8meg	▲0Ω	▲14Ω	▲14.5Ω	▲†155Ω	▲†4800Ω	▲150Ω		
V18	14RP4A	0Ω	12Ω	PIN 6 †22Ω	PIN 10 ‡0Ω	PIN 11 •190K	PIN 12 1.5Ω			

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL PICTURE.
* MEASURED IN "UHF" POSITION.
† MEASURED FROM 135V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
▲ MEASURED IN "RADIO" POSITION.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART

PROPERTY OF
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EMERSON MODELS 1254, 1255, 1258, 1259, 1264, 1265, 1268, 1269, 2064, 2065
(Ch. 120341H, 120342R, 120347H, 120348R, 120358H, 120359R)

ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	UHF Oscillator	2AF4A	
V2	RF Amp	4BQ7A	
V3	Mixer-1st	5AT8	
V4	1st Video IF Amp	3CB6	
V5	2nd Video IF Amp - Sound IF Amp - Video Det	5AM8	
V6	Video Output	12BY7A	
V7	Limiter-Sync Sep	8U8	
V8	Discriminator-AF Amp.	5T8	
V9	Audio Output	12C5	Note 1
V10	Sync Amp.-Vert. Mult.	6CG7	
V11	Vert. Mult.-Vert. Output	12AV6GT	
V12	Horiz. AFC-Horiz Osc	6CG7	
V13	Horiz. Output	25GV6	Note 2
V14	Damper	12AX4GTA	Note 3
V15	HV Rectifier	1B3GT	
V16	Convester	3BZ8	
V17	AM IF Amp	3BA6	

Note 1. Some versions may use 12CU5 in this application.
Note 2 Some versions may use HC25BGA in this application.
Note 3. Chassis 120358H, 120359H use a 12D4 in this application.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: EMERSON PART No.	GENERAL ELECTRIC PART No	SYLVANIA PART No.	NOTES
V18	148P4A		14BP4A ①	① Silver screen '65
	17AVP4A	17AVP4A	17AVP4A ①	② Aluminized
		17AVP4A ②	17AVP4A ①	
			17AVP4	
	21ALP4B	21ALP4B	21ALP4A	
		21ALP4A ②	21ALP4B ①	
		21ALP4	21ALP4 ①	
	21BTP4	21BTP4	21BTP4 ①	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1A	250	150	925386 ①	PR3-043					R1896 *	
B	120	150								
C	25	25								
C2A	250	150	925385	PR3-130		WD351			R1896 *	
B	50	150								

* Non-catalog item.
① Alternate part #926387. Chassis 120358H, 120359H use a 250mfd ① 160V, 120mfd ② 160V, 50mfd ③ 50V (Part #925413) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	5									N900
C4	5									N900
C5	15									N80
C6	3.8									N220
C7	300									
C8	1000		981284	EF-001	MFT-1000				503C-D1	
C9	1000		981284	EF-001	MFT-1000				503C-D1	
C10	1000		981284	EF-001	MFT-1000				503C-D1	
C11	120			BPD-00012	DD-121	L10T12	ED-120	UC-5312	SCA-T12	
C12	5			NPO-DZ 5	TCZ-4ST	C20V5C	TCO-5	ZT-5568	STCCB-V5	NPO 10%
C13	6 8			NPO-SZ 6.8	TCZ-6S8	C10V68C	TCO-6.8	ZT-5568	STCCB-V68	NPO 10%
C14	6 8			NPO-SZ 6.8	TCZ-6S8	C10V68C	TCO-6.8	ZT-5568	STCCB-V68	NPO 10%
C15	1000			BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C16	1000			BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C17	2 2			NPO-SZ 2.2	TCZ-2S2	C10V22C	TCO-2.2		STCCB-V22	NPO 10%
C18	3-12		981363							
C19	1000			BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C20	1000			BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C21	0 5-3		981068		529-3		31S-E	CY265A	503C-D1	
C22	1000		981284	EF-001	MFT-1000				503C-D1	
C23	1000		981284	EF-001	MFT-1000				503C-D1	
C24	90		981398							
C25	0 5-3		981068		529-3		31S-E	CY265A		
C26	1000			BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C27	1000		981284	EF-001	MFT-1000				503C-D1	
C28	5									
C29	2 0			NPO-S1 1.0	TCZ-1		TCO-1		STCCB-V1	
C30	5									N900
C31	10									N1400
C32	1000		981284	EF-001	MFT-1000				503C-D1	
C33	1000		981284	EF-001	MFT-1000				503C-D1	
C34	1000		981284	EF-001	MFT-1000				503C-D1	
C35	1000			BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C36	1000			BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C37	1000		981284	EF-001	MFT-1000				503C-D1	
C38	50-380		900163							
C39	1000		928933	BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C40	1000		928933	BPD-001	DD-103	BYAS01	ED-1000	DCS2	SHK-D1	
C41	1	200	923315	P388N-1	DF-104	CUB2P1		GEM-201	27M-P1	
C42	580		928908		DS-581	UA5T58	ED-580		MS-358	10%
C43	1000		928933	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C44	100		928927	N750-S1 100	TCN-100	C10T1U	TCT-100	NT-531	STCU-T1	N750 10%
C45	830		928810			UR5T83	ED-830		MS-382	10%
C46	680		928909		DS-681	UA5T68	ED-680		MS-358	10%
C47	47		928896	N750-S1 47	TCN-47	C10Q47U	TCT-47	NT-5447	STCU-Q47	N750 10%
C48	10		928218	NPO-S1 10	DS-100	CTA5Q1C	ED-10	ZT-541	STCC-Q1	10%
C49	4 7		928213	NPO-S1 4.7	TCZ-4R7	CTA5V47C	TCO-4.7	ZT-555	STCCB-V47	10%
C50	047	400	925401	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C51	047	400	924554	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C52	100			N750-S1 100	TCN-100	C10T1U	TCT-100	NT-531	STCU-T1	N750 10%
C53	4700		928923	BPD-0047	DD-473	BYA10D47	ED-0047	UC-5347	SGA-D47	
C54	4700		928923	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	SGA-D47	
C55	1000		928919	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C56	0047	500	930055	P688N-0047	DS-472	CUB6D47	GP-4700	GEM-6247	47M-D47	
C57	2200		928921	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	SGA-D22	
C58	022	400	930059	P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	47M-S22	
C59	0047	600	924753	P688N-0047	DS-472	CUB6D47	GP-4700	GEM-6247	47M-D47	
C60	01	400	928814	P488N-01	DS-103	CUB4P1	GP-10000	GEM-401	47M-S1	
C61	220		911184	1488-00022	DS-221	5WS722	GP-220	UC-5322	1FM-S22	
C62	01	400	930057	P488N-01	DS-103	CUB4S1	GP-10000	GEM-411	47M-S1	
C63	0047	400	924453					GEM-16247	47M-S47	10%
C64	1000		928919	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C65	1000		928919	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C66	1	400	924518	P488N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C67	1 1	400	924515	P488N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C68	01	400	924514	P488N-01	DS-103		GP-10000	GEM-411	47M-S1	
C69	1000	2000	928930	HYD-30-1000	DD30-102	HYB10D1	HD3-1000	DC3021	30HK8-D1	
C70	03		911180	1489-000032	DS-320	32S5Q3	ED-33		MS-483	10%
C71	02		911180	1488-000082	DS-220	22S5Q3	ED-33		MS-483	10%
C72	047	200	924354	P288N-047	DF-503	CUB2S47			47M-S47	
C73	022	400	930059	P488N-022	DD-203	CUB4S22	ED-02	GEM-4122	47M-S22	
C74	47	200	930033	P288N-47		CUB2P47		GEM-2047	27M-P47	
C75	047	400	930027	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C76	330		911167	1489-00033	DS-331	5RS733	ED-330		MS-333	10%
C77	01	600	924514	1494-00082		1R5T93	ED-S20		MS-382	10%
C78	820		911235							10%
C79	001	400	924513	P488N-001	DS-102	CUB4D1	GP-1000	GEM-421	47M-D1	
C80	100		928914							10%
C81	01	400	923514	P488N-01	DS-103	CUB4S1	GP-10000	GEM-411	47M-S1	
C82	1	400	924515	P488N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C83	100	3000	929923							10%
C84	1	400	924515	P488N-1	DF-104	CUB4P1		GEM-401	47M-P1	
C85	1	400	923306	P488N-1	DF-104	CUB4P1		GEM-401	47M-P1	②
C86	1	200	923315	P388N-1	DF-104	CUB2P1		GEM-201	27M-P1	
C87	1000		928933	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C88	1000		928933	BPD-001	DD-102	BYAS01	ED-1000	DCS2	SHK-D1	
C89	1000	1500	928927	HYD-15-100	DD30-102	HYB10D1	HD15-1000	DC3021	30GA-D1	
C90	10000		922301	BPD-01	DD-103	BYAS01	ED-01	DCS11	SHK-01	
C91	470		928966		DS-471	5RS747	ED-470		MS-347	10%
C92	18				TCZ-18	C10Q18C	TCO-18			NPO 10%
C93	047	400	923554	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C94	047	400	923554	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C95	047	400	923554	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	
C96	220		928946	BPD-0022	DD-221	L5T23	ED-220	UC-5323	SOA-T22	
C97	047	400	923554	P488N-047	DF-503	CUB4S47		GEM-4147	47M-S47	

① Some versions use 150mmf 10% (Part #928903) in this application.
② Some versions use .01mfd in this application.

CONTROLS

ITEM No.	RATING: RESIST ANCE	WATTS	REPLACEMENT DATA: EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500Ω	½	390481	F3-2	RTV-84		● U337638	Contrast
B	1meg	½		R3-S3	Not Req.			Volume
C	Switch	½		K3-1	Not Req.			
R2A	200K	½	390483	B-46	A47-200K-S	Q1-129	U43	Brightness
B	Shaft	½		Not Req.	F3-3	Not Req.	Not Req.	
R3A	1meg	½	390485	B-99	A47-1meg-S	Q1-137	U54	Vert. Hold
B	Shaft	½		Not Req.	F3-3	Not Req.	Not Req.	
R4A	50K	½	390484	B-31	A47-50K-S	Q1-123	U35	Horiz. Hold
B	Shaft	½		Not Req.	F3-3	Not Req.	Not Req.	
R5	1meg	½	390403					Vert. Size
R6	500Ω	½	390405					Vert. Linearity
R7A	100K	½	390485	B2K-40	A47-100K-S		PT1A2L	Pix Stabilizer
B	Shaft	½		Not Req.	R3N-3		Not Req.	

● STA-LOC Equivalent FA52R, OF8TS, RU16A, SH12L, US-6L.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	EMERSON PART No.	NOTES
R8	680K			
R9	680K			
R10	10K			
R11	680K			
R12	4700Ω			
R13	330Ω			
R14	10K			
R15	820Ω			
R16	220K			
R17	47K			
R18	2200Ω			
R19	47Ω			
R20	10K			
R21	10K			
R22	3300Ω			
R23	100Ω			
R24	100K			
R25	6800Ω		350492	
R26	470K		341132	Note 1
R27	470Ω		350412	
R28	56Ω		340893	
R29	27K		340832	
R30	470Ω		350412	
R31	180Ω		340312	
R32	3900Ω		340632	
R33	820Ω		340732	
R34	470K		351132	
R35	10K		340732	
R36	4700Ω		340692	Note 2
R37	5600Ω	2	397102	
R38	15K		340772	
R39	150K		341012	
R40	27K		340832	
R41	330Ω		340892	
R42	470Ω		350412	
R43	18K		340792	
R44	22K		340812	
R45	100K		340772	
R46	100K		340672	
R47	2.2meg		351292	
R48	220K		351052	
R49	470K		351132	
R50	4700	2	390412	
R51	180Ω		340312	
R53	2.2meg		351292	
R53	470K		351132	
R54	22meg		341532	Note 2
R55	27K		340832	
R56	15K		340772	
R57	1meg		351312	
R58	10K		340732	
R59	3300Ω		340612	
R60	680K		341172	
R61	100K		340972	
R62	100K		340972	
R63	100K		340972	
R64	220K		351052	
R65	100Ω		350852	
R66	2.2meg		351292	
R67	2200Ω		340532	
R68	6800Ω		350452	
R69	6800Ω		350452	
R70	330K		340832	
R71	1.5meg		341332	
R72	820K		341132	
R73	330K		341092	
R74	100K		340972	
R75	150K		341012	
R76	82K		340852	
R77	39000		340832	
R78	150K		341012	
R79	220K		341052	
R80	8200Ω		340712	
R81	100K		340972	
R82	47K		340852	
R83	100Ω		350352	
R84	150K		341012	
R85	15K		340772	
R86	33K	1	370852	
R87	4700	1	370412	
R88	10K		340732	
R89	10Ω		340012	Note 3
R90	1.5Ω			Note 4
R91	22K		340812	
R92	22meg		351532	
R93	3.3meg		351332	
R94	4700Ω	1	380852	
R95	150Ω		340292	
R96	1meg		351312	
R97	47K		350892	
R98	1200Ω	1	370372	
R99	6Ω	5	394156	
R100	1Ω	1	394171	
R101	300Ω		340372	

RESISTORS (cont)

ITEM No	RATING: OHMS	WATT	EMERSON PART No	NOTES
R102	300Ω		340372	
R103	220K		351057	

ITEM No	RATING: OHMS	WATT	EMERSON PART No	NOTES
R10	220K		351057	
R105	100Ω		350352	

Note 1. Some versions use a 1meg (Part #351312) in this application.
Note 2. Not used in some versions.
Note 3. Some versions use an 18Ω in this application.
Note 4. Some versions use a 2.7Ω in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No	Haldorson PART No.	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T1	Vert Output	723137							
T2A	Alt. Vert. Output	723126							
B	Yoke-Horiz. (328ΔE) (90°)-Vert. (40MH)	703312	DF50T D 2	MDF-92 1 2	Y90F19/43 1 2	DY-18A 1 2	Y-16 1 2	Y-41 & NW17 1	
T3	Horiz Output	723230		HVO-87 *	X136 *				

① Connect same as original, use original rear cover, centering device and width sleeve .
② Use original horizontal damping network.
Cut and form a piece of .010 gauge flat paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeve and the yoke proper.

TRANSFORMER (AUDIO OUTPUT)

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA
Use Original Width Coil Unless Replacement Type Is Listed

ITEM No.	ORIGINAL TERMINAL CONNECTIONS	REPLACEMENT DATA: Haldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	4	4	4				
	7	8	8				
	5	7	7				
	2	2	2				
	1	1	1				

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: EMERSON PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	20000	3-4Ω	734144	22U6 ①	A-3032①	A-3332 ①	24S53①	S-12X ①	① Use original channel mounting frame.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: EMERSON PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	180JJ ①	4A07	① Used in Models 1254, 1255, 1264, 1265, 1259, 1250, 1268, 1269.
	4"	PM		180JS ②		② Used in Models 2064, 2065

COILS (RF-IF)

ITEM No.	USE	EMERSON PART No.	NOTES
L1	RF Choke	981538	
L3	UHF IF Input Trans.	981539	
L3	VHF Ant. Coil	981288	
L4	VHF Ant. Coil	981286	

ITEM No.	USE	EMERSON PART No.	NOTES
L5	IF Trap Coil	981364	
L6	IF Trap Coil	981287	
L7	Mixer Plate Coil	981689	

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L8	1st. Video IF	730251					Includes Cap.
L8A	2nd. Video IF	730252					
B	1st. Sound IF						
L10A	3rd. Video IF	730253					
B	2nd. Sound IF						
L11	RF Choke	708312	19-1005	BC-566	4612		11 Microhenries
L12	Shunt Peaking Coil	708274	19-3660	TV-306	6148		680 Microhenries
L13	Series Peaking Coil	708272	19-3300	TV-190	6121	V2-7	330 Microhenries
L14	Shunt Peaking Coil	708274	19-3660	TV-306	6148		680 Microhenries
L15	RF Choke	708312	19-1005	BC-566	4612		11 Microhenries
L16	RF Choke	708271	19-1003	BC-564	4608		4.6 Microhenries
L17	Discriminator	708276					
L18	4.5Mc Trap	708288					Includes C82
L19	Ant. Coil	710032					
L20	Osc. Coil	716111	14-1073	BC-393 *	69-Osc *		
L21	Input IF	720075	16-6788	BC-353	12-C1	RF-1	
L22	Output IF	720075	16-6788	BC-353	12-C2	RF-2	

* Drill mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.: PRI.	SEC	REPLACEMENT DATA: EMERSON PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L23	100Ω *		T16103						Horiz. Freq. * Tapped @ 72Ω Horiz. Waveform
L24	37Ω		T08275						

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (D CURRENT 100% ~%)	REPLACEMENT DATA: EMERSON PART No.	Haldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L25	250A	22Ω	.5 Hy.	737083					C-27X

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	EMERSON PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.290A	817047 ①②	1023A ①	1N1007 ③	RS350SL ①	350A ① M500 ④	① Selenium type. ② Alternate part # 817066 (silicon type) used in Ch. 120358H, 120359R ③ Germanium type. ④ Silicon type.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	N	1A 125V S/B	808014		333001. (N-1A-125V-S/B)	346011	N1	HN 3/4 to 1 1/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		EMERSON PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N294	817061	1N54A	1N34A	AM Det., AVC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M4	Tuner	470987	UHF/VHF - Chassis ending with suffix "R"
	Tuner	470980	VHF - Chassis ending with suffix "H"
M5	Tuning Cap.	900166	2 Gang (Ant. 12-295mmf, Osc. 12-115mmf)
M6	Switch	510085	Radio-Phono-TV, Rotary, wafer type
	Switch	510125	Radio-Phono-TV (Alternate)
M7	Width sleeve	412302	
M8	Centering Device	708277	Includes yoke cover
M9	Ion Trap	708316	
M10	Magnet	708234	Barkhausen Eliminator
	Yoke Clamp	412794	

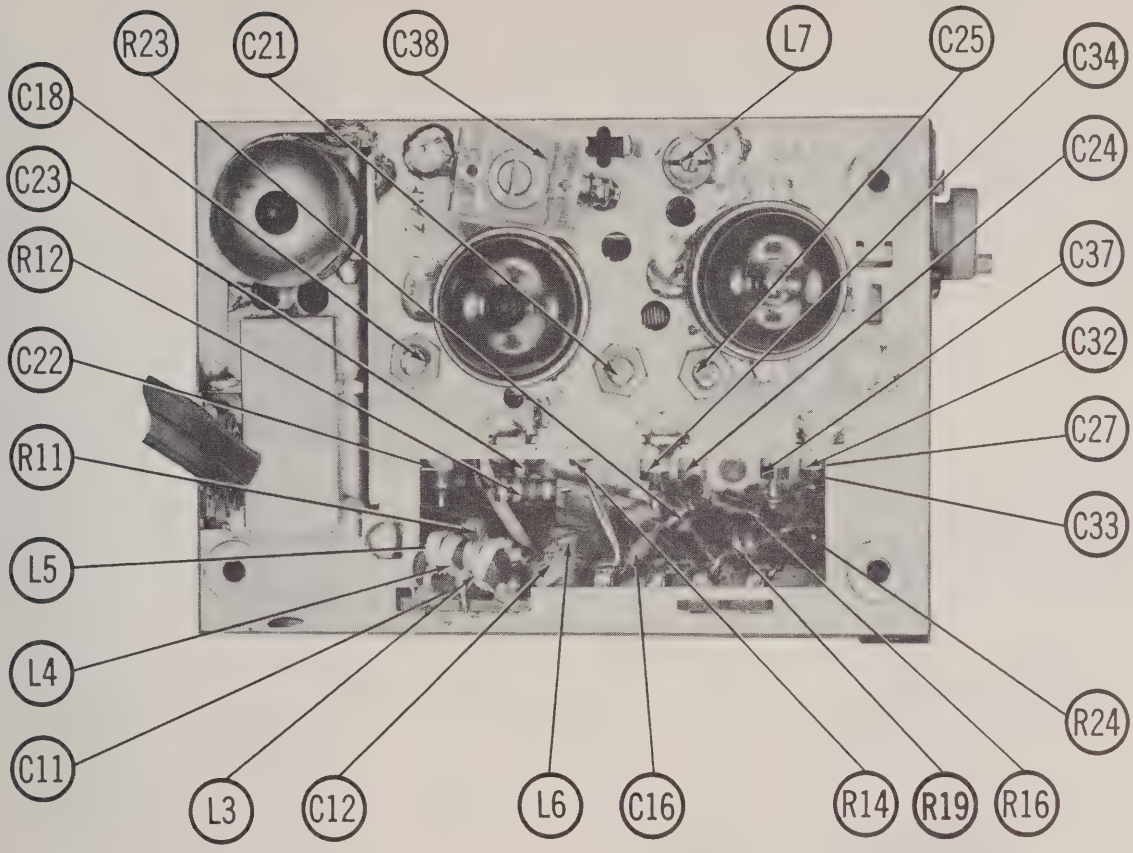
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

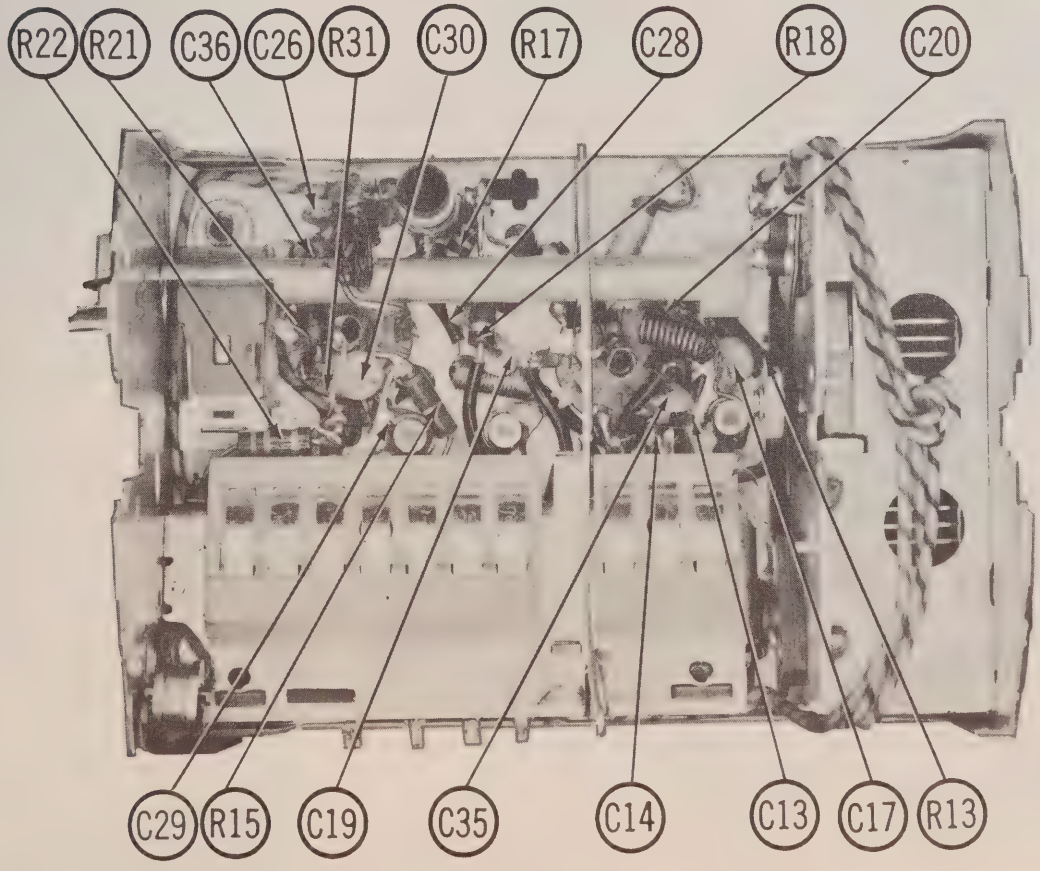
NAME	PART NO.	DESCRIPTION
Safety Glass	460803	Models 1254, 1255
Safety Glass	460804	Models 1264, 1265
Safety Glass	520256	Models 2064, 2065
Knob	460859	Radio Tuning - Models 1258, 1259
Knob	460861	Radio Tuning - Models 1268, 1269
Knob	460860	Function Switch - Models 1258, 1259
Knob	460862	Function Switch - Models 1268, 1269
Knob	460830	UHF Selector - Models 1255, 1259
Knob	460831	UHF Selector - Models 1265, 1269
Knob	460828	VHF Channel Selector - UHF Models 1255, 1259
Knob	460829	VHF Channel Selector - UHF Models 1265, 1269
Knob	460844	VHF Channel Selector - VHF Models 1254, 1258
Knob	460821	VHF Channel Selector - VHF Models 1264, 1268
Knob	450258	VHF Channel Selector - Model 2064
Knob	460907	VHF Channel Selector - Model 2065
Knob	460826	Fine Tuning - UHF Models 1255, 1259
Knob	460827	Fine Tuning - UHF Models 1265, 1269
Knob	460765	Fine Tuning - VHF Models 1254, 1258
Knob	460820	Fine Tuning - VHF Models 1264, 1268
Knob	450209A	Fine Tuning - Model 2064
Knob	460692	Fine Tuning - Model 2065
Knob	460908	UHF Channel Selector - UHF Model 2065
Knob	460806	On-off-volume - Models 1254, 1255
Knob	460824	On-off-volume - Models 1264, 1265
Knob	450207A	On-off-volume - Models 2064, 2065
Knob	460807	Contrast - Models 1254, 1255
Knob	460822	Contrast - Models 1264, 1265
Knob	450208A	Contrast - Models 2064, 2065
Knob	460808	Vert. Hold, Horiz. Hold, Brightness - Models 1254, 1255
Knob	460823	Vert. Hold, Horiz. Hold, Brightness - Models 1264, 1265
Knob	450212A	Vert. Hold, Horiz. Hold, Brightness - Models 2064, 2065

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

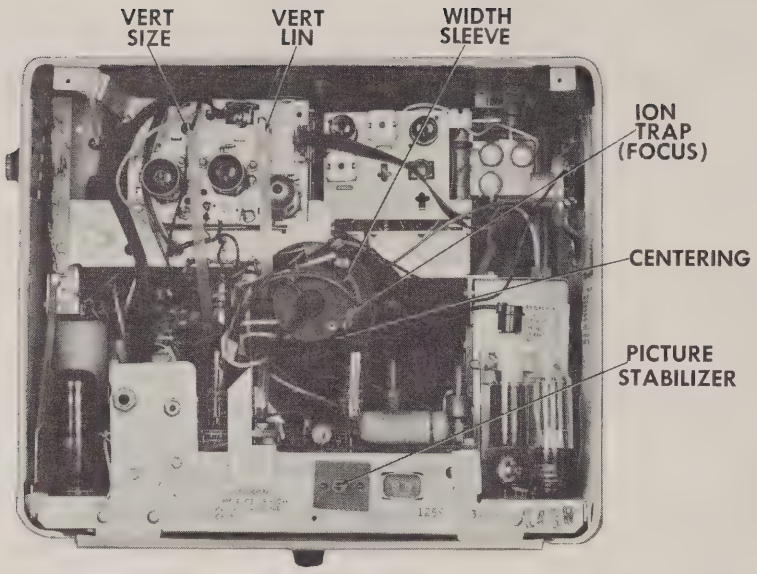


TUNER-TOP VIEW



TUNER-BOTTOM VIEW

FOLDER 1



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Connect a clip lead across the horizontal waveform coil (L24).

2. Turn picture stabilizer control (R7) fully clockwise and tune to a known station.

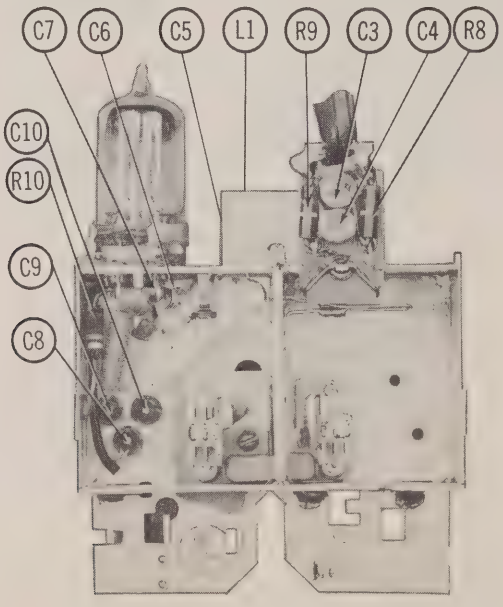
3. Set the horizontal hold control fully clockwise.

4. Starting with the horizontal frequency slug (B1) fully counter clockwise, rotate clockwise until the picture just locks into sync. Then turn one-half turn more.

5. Remove the clip lead from L24 and starting with the horizontal waveform slug (B2) fully counter clockwise; then turn B2 clockwise until the picture almost locks into sync (3-4 diagonal bars).

6. Turn the horizontal hold control counter clockwise until the picture locks in and then back to full clockwise. If the picture falls out of sync, adjust B1 SLIGHTLY.

7. Check for horizontal hold while switching channels. If good hold action is not obtained at full clockwise position of the horizontal hold control, turn B1 in SLIGHTLY until desired results are obtained. If excessive squedging (Christmas Tree effect) is experienced while switching channels, readjust B2 SLIGHTLY. Check to make sure no horizontal bending is introduced at the top of the picture.



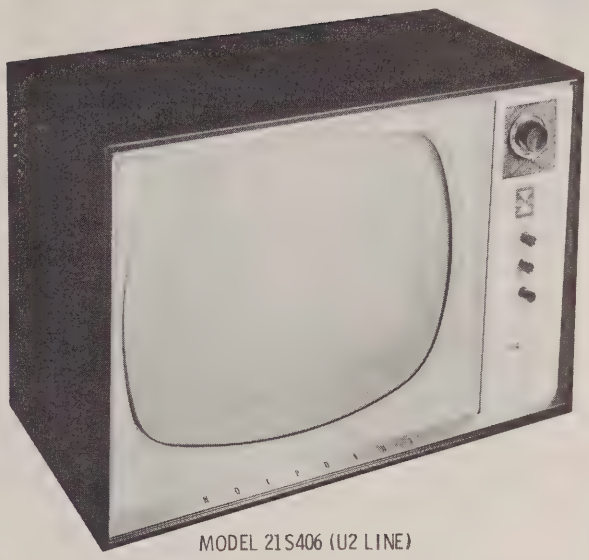
TUNER REAR VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 push-on type knobs from the front.
2. Remove 8 metal screws from the rear cover. Remove the rear cover.
3. Remove the speaker leads.
4. Remove 2 metal screws from the brace at the upper left side of the cabinet.
5. Remove 2 hex nuts holding the right hand picture tube braces.
6. Remove 4 chassis bolts from the bottom.
7. Remove the chassis.



MODEL 21S406 (U2 LINE)

HOTPOINT MODELS 21S406, 21S455, 21S456, 21S507, 21S508, 21S555, 21S556, 21S605, 21S606 (U2 Line)

TRADE NAME	Hotpoint MODELS
	21S406, 21S455, 21S456, 21S507, 21S508, 21S555, 21S556, 21S605, 21S606 ... U2 Line
MANUFACTURER	Hotpoint Co., 5600 W. Taylor St., Chicago 44, Illinois
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 190 Watts, 1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 11 o'clock, proceed in counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 metal screws from the bottom holding the trim strip at the bottom of the safety glass. Remove the trim strip and safety glass.

FOCUS

Focus may be varied by the connection of the lead from pin 6 of the picture tube to ground, low B boost or high B boost at the lower right hand edge of the printed board. Readjust ion trap for maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A12) located on top of chassis.

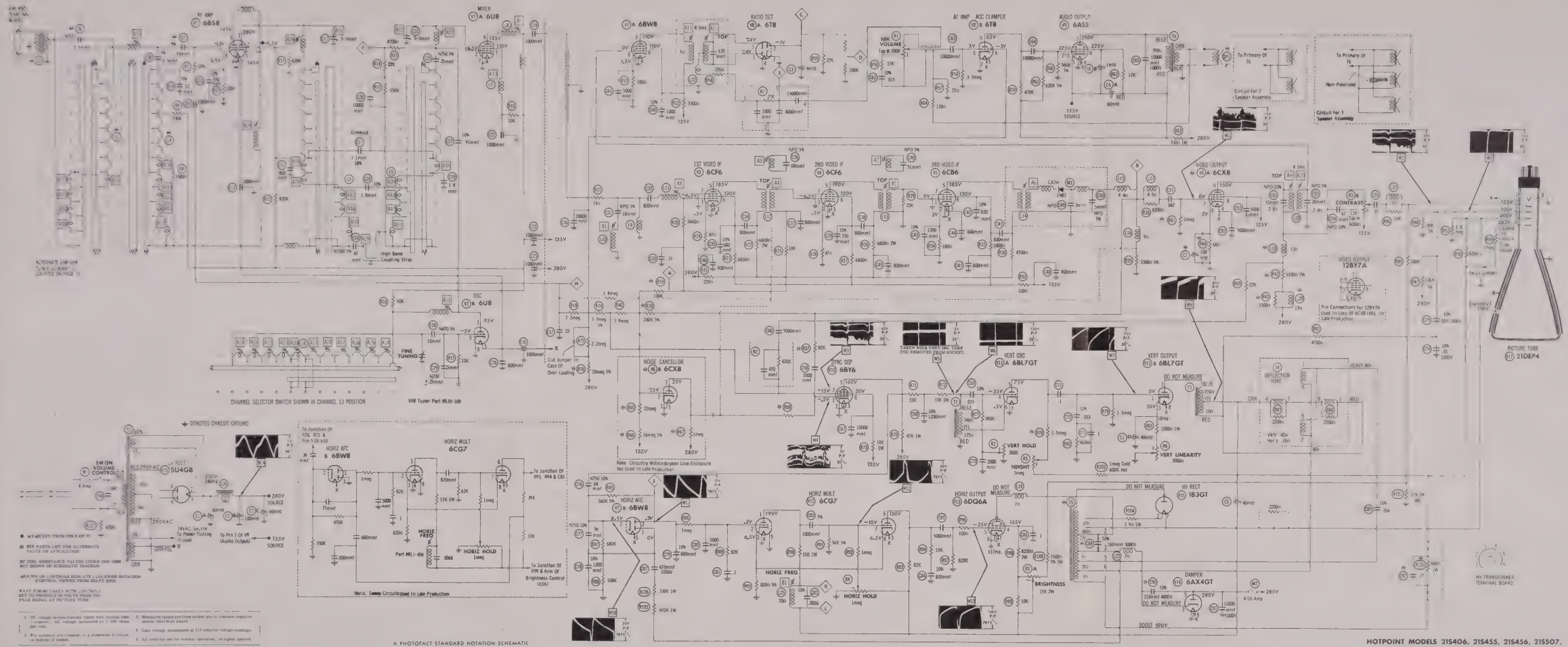
FUSES

Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

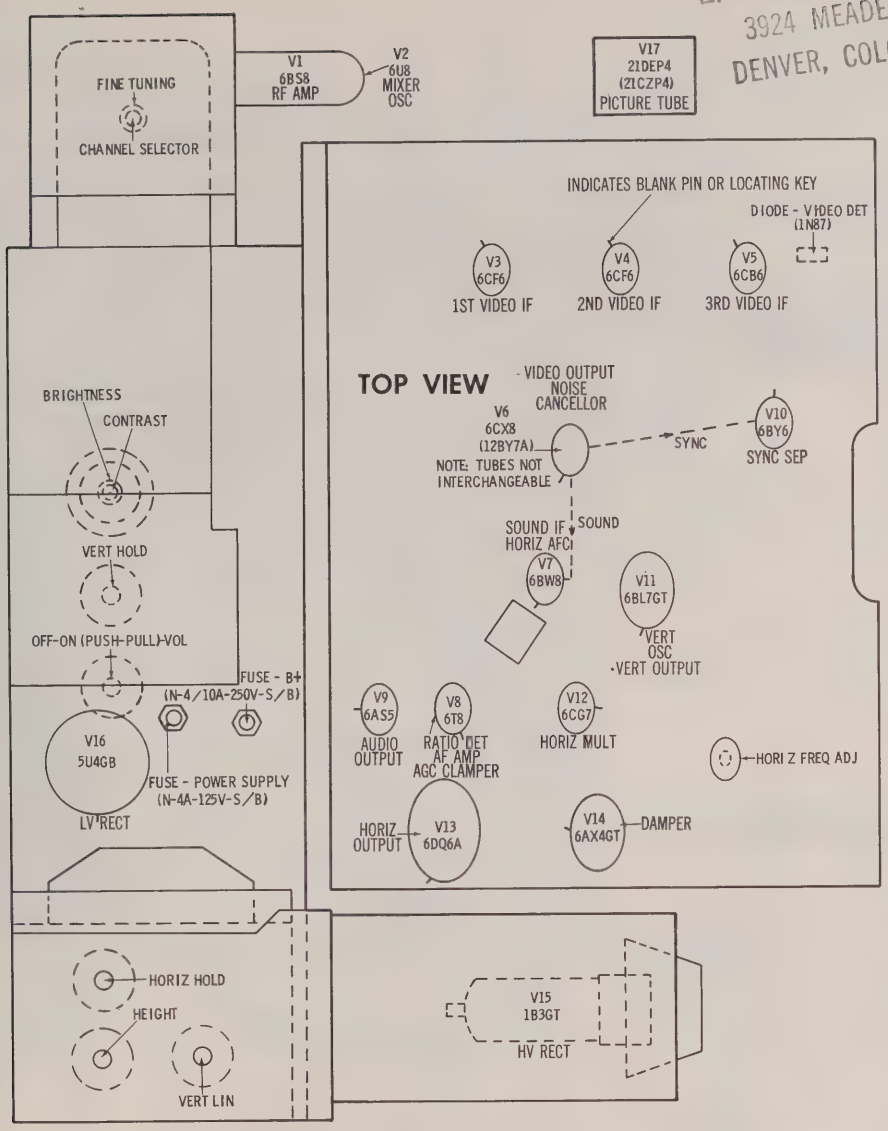


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

HOTPOINT MODELS 215406, 215455, 215456, 215507, 215508, 215555, 215556, 215605, 215606 (U2 Line)

TUBE PLACEMENT CHART

3924 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

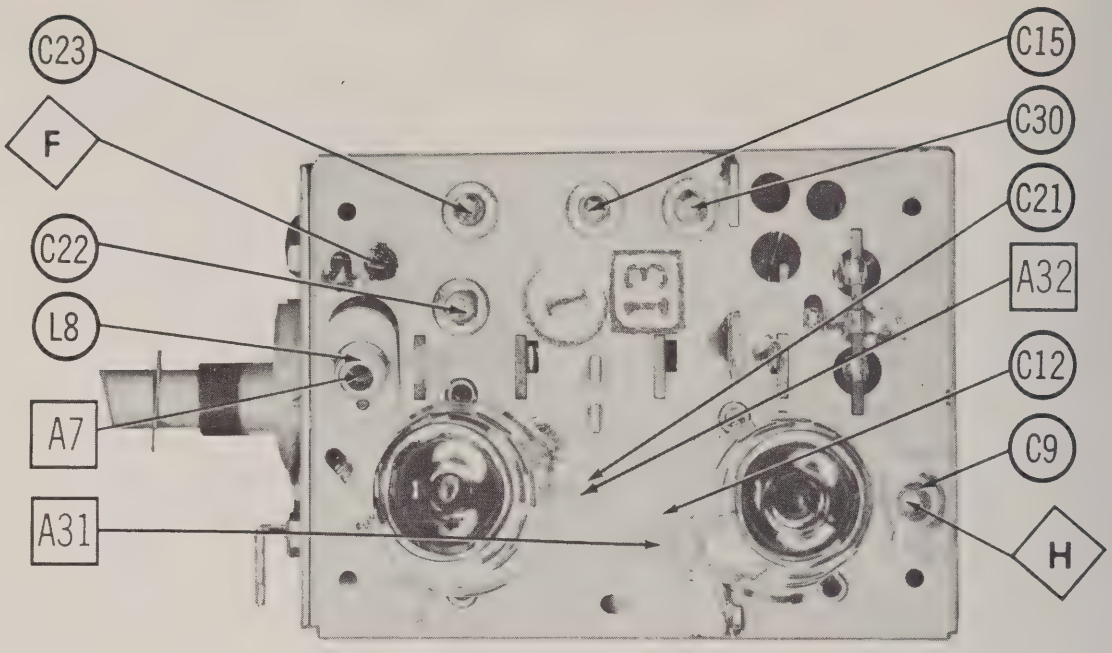
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M1), V16**

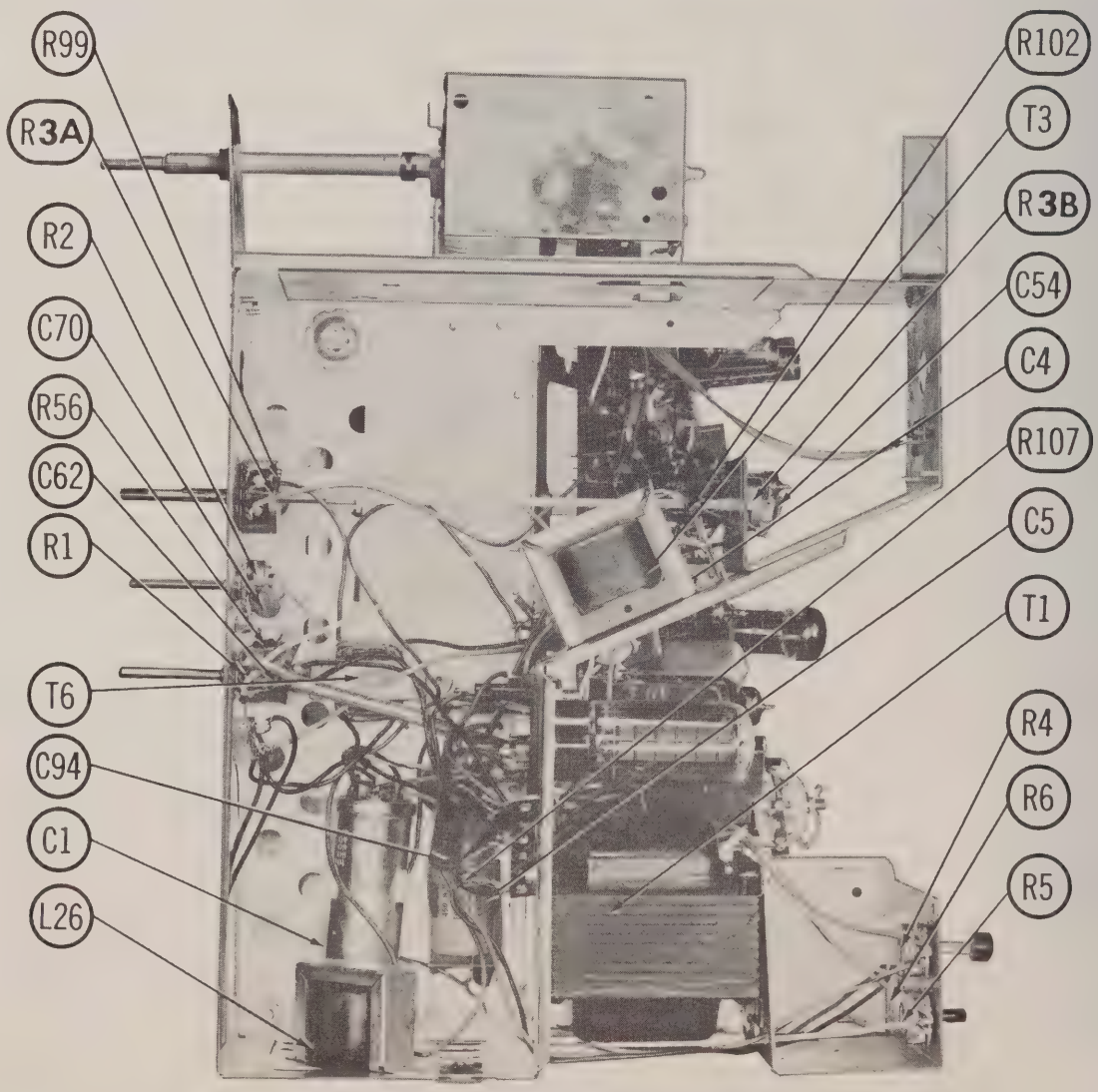
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M3), V6, V9**
No pic, no sound, has snow - **V1, V2, V3, V9**
No pic, has sound, has raster - **V6, V17, V9**
Has pic, no sound - **V7, V8, V9**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V10, V9 (V6 some versions)**
No horiz. sync - **V10, V7, V9, (V6 some versions)**
No vert. or horiz. sync - **V10, V9, (V6 some versions)**

SWEEP FAILURE
No raster, has sound - **Fuse (M2), V7, V12, V13, V14, V15, V17**
No vertical deflection - **V11**
Poor vert. linearity or foldover - **V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V16**
Vert. off freq. - **V11**
Horiz. off freq. - **V12**



TUNER TOP VIEW



CHASSIS BOTTOM VIEW

HOTPOINT MODELS 215406, 215455, 215456, 215507, 215508, 215555, 215556, 215605, 215606 (U2 Line)

CAPACITOR IDENTIFICATION

...ENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Set the volume control fully counter clockwise.
Set the contrast control fully clockwise.
Connect the negative lead of 3 volt bias supply to point Ⓐ. Positive to chassis.
Remove the horizontal output tube (V13) to reduce shock hazards.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
If a slug has two peak positions, use the one with the slug in the "Out" position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	44.0MC (10MC Swp)	47.25MC	11	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A1, A2	Adjust for MINIMUM amplitude at marker.
2.	"	"	"	41.25MC	"	"	A3	"
3.	"	"	"	42.5MC	"	"	A4	Adjust to place marker at 65% on curve as in Fig. 1.
4.	"	"	"	45.75MC	"	"	A5	Adjust to place marker at 40% on curve as in Fig. 1.
5.	"	"	"	42.5MC 45.75MC	"	"	A6	Adjust for proper tilt and symmetry similar to Fig. 1.
6.	"	"	"	45.75MC	"	"	A7, A8	Adjust for maximum gain at 45.75MC marker.

4.5MC TRAP ALIGNMENT

Turn the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (400∿ AM)	Any non-interfering channel	Vert. Amp. thru detector network (Fig. 2) to pin 7 (cathode) of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

SOUND IF ALIGNMENT

A weak TV signal should be substituted for the signal generator, if possible.
Keep the volume control turned down unless the speaker is connected.
Connect two matched 100K (±1%) resistors in series from point Ⓒ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A10, A11	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓔ. Common to point Ⓓ.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Set the fine tuning two-thirds turn from the counter clockwise stop and leave it in this position.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 3	Across antenna terminals thru matching network (Fig. 3).	213MC	211.25MC	13	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 45%.
			207MC	205.25MC	12		A14	
			201MC	199.25MC	11		A15	
			195MC	193.25MC	10		A16	
			189MC	187.25MC	9		A17	
			183MC	181.25MC	8		A18	
			177MC	175.25MC	7		A19	
			85MC	83.25MC	6		A20	
			79MC	77.25MC	5		A21	
			69MC	67.25MC	4		A22	
			63MC	61.25MC	3		A23	
			57MC	55.25MC	2		A24	

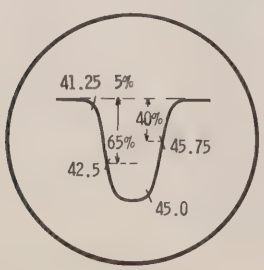


FIG. 1

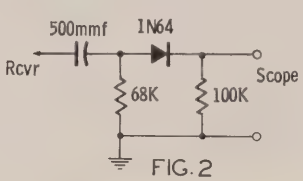
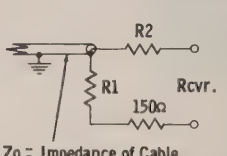


FIG. 2



Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point (H). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Fig. 3	Across antenna terminals thru matching network (Fig. 3).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K to point (F). Low side to chassis.	A25, A26, A27, A28, A29, A30	Adjust for maximum gain and symmetry of response similar to Fig. 5 with markers as shown. A29 adjusts bandwidth. A30 controls tilt.
12.	"	"	177MC	175.25MC 179.75MC	7	"	A31, A32	Adjust for maximum gain and symmetry of response similar to Fig. 5 with markers as shown. Retouch A25 for maximum gain and equal peaks.
13.	"	"	207MC	205.25MC 209.75MC	12	"		Make compromise adjustments of A25 thru A29 and/or A31 and A32, if necessary. Replace tuner shield when checking response
			201MC	199.25MC 203.75MC	11			
			195MC	193.25MC 197.75MC	10			
			189MC	187.25MC 191.75MC	9			
			193MC	181.25MC 185.75MC	8			
14.	"	"	85MC	83.25MC 87.75MC	6	"	A33, A34, A35, A36	Adjust for maximum gain and symmetry of response similar to Fig. 6 with markers as shown. Adjust bandwidth by positioning "Gimmick".
15.	"	"	79MC	77.25MC 81.75MC	5	"	A37, A38, A39, A40	Adjust for maximum gain and symmetry of response similar to Fig. 6 with markers as shown.
16.	"	"	69MC	67.25MC 71.75MC	4	"	A41, A42, A43, A44	"
17.	"	"	63MC	61.25MC 65.75MC	3	"	A45, A46, A47, A48	"
18.	"	"	57MC	55.25MC 59.75MC	2	"	A49, A50, A51, A52	"

40MC CHANNEL ALIGNMENT OF TUNER #RJX-110

Connect bias as under "VHF RF and Mixer Alignment".
Disconnect the IF link from L9 and terminate with 68Ω resistor at open end only.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Fig. 7	High side to point (G). thru network (Fig. 7).	43.5MC (10MC Swp)	40.5MC 45.75MC	UHF Tune UHF for MINIMUM tilt over center tuning area.	Vert. Amp. thru 10K to point (F). Low side to chassis.	A53, A54, A55, A56	Adjust A53 for correct placement of 40.5 MC marker. (See Fig. 8). Adjust A54 and A55 for maximum gain and symmetry. Adjust A56 for maximum gain and zero tilt.

VHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

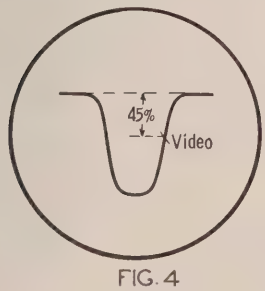


FIG. 4

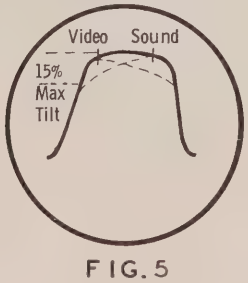


FIG. 5

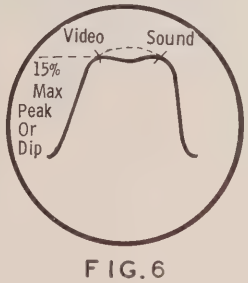


FIG. 6

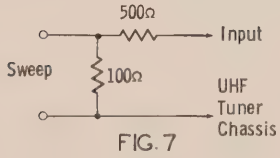


FIG. 7

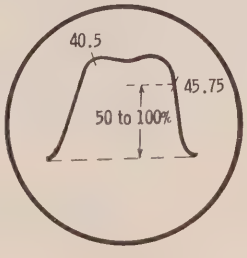
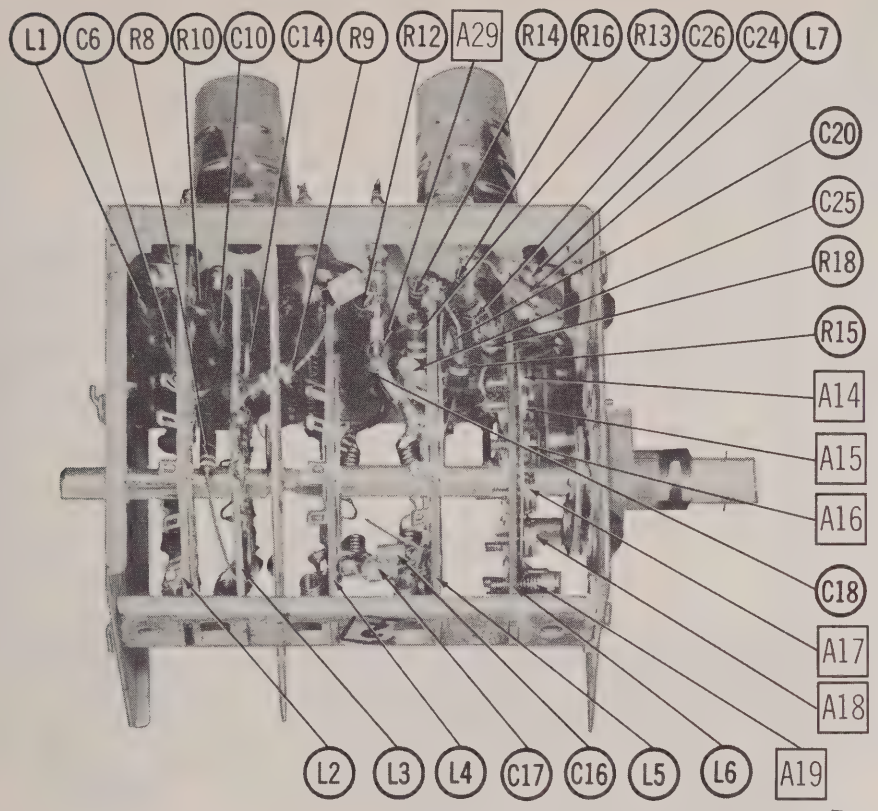


FIG. 8

HOTPOINT MODELS 215406, 215455, 215456, 215507, 215508, 215555, 215556, 215605, 215606 (U2 Line)

FOLDER 2



TUNER-LEFT SIDE

PROPERTY OF
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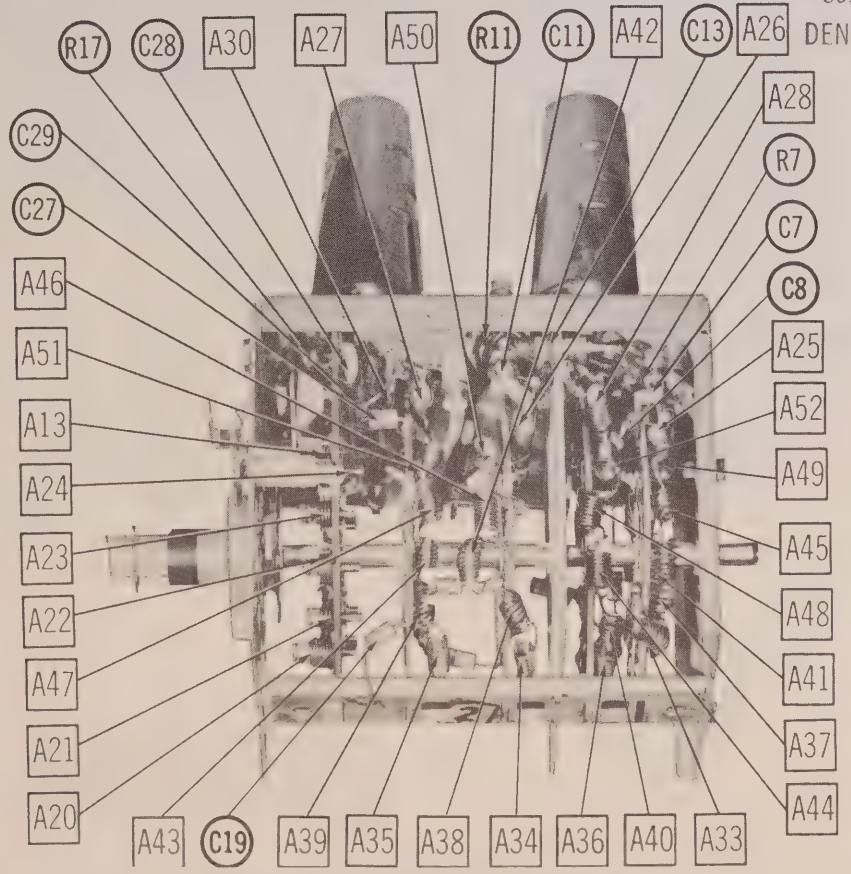
3924 MEADE ST.
DENVER, COLORADO

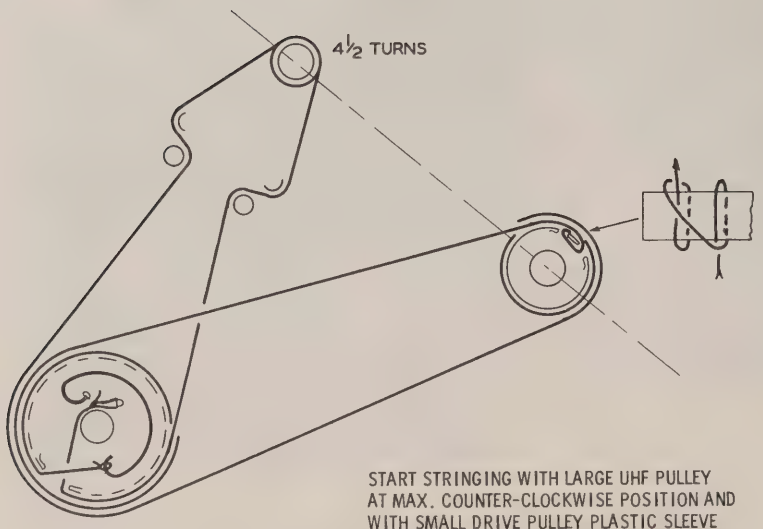


TUNER-RIGHT SIDE

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	† .1Ω	400K	INF	0Ω	.1Ω	INF	10meg	100Ω	0Ω
V2	6U8	■ 10K	175K	■ 10K	0Ω	.1Ω	■ 0Ω	0Ω	0Ω	10K
V3	6CF6	340K	47Ω	.1Ω	0Ω	† 7000Ω	■ 6900Ω	0Ω		
V4	6CF6	350K	47Ω	.1Ω	0Ω	† 7000Ω	■ 6900Ω	0Ω		
V5	6CB6	.1Ω	180Ω	.1Ω	0Ω	† 4900Ω	■1100Ω	0Ω		
V6	6CX8	0Ω	240K	† 1meg	.1Ω	0Ω	68Ω	1meg	■ 0Ω	† 5100Ω
V7	6BW8	100K	780K	1.3meg	0Ω	.1Ω	2.4Ω	180Ω	■ 3300Ω	■3300Ω
V8	6T8	INF	22K	INF	0Ω	.1Ω	5meg	0Ω	3.3meg	† 470K
V9	6AS5	¶	290K	0Ω	.1Ω	290K	† 12K	† 720Ω		
V10	6BY6	† 2.2meg	0Ω	.1Ω	0Ω	† 47K	■ 18K	3.5meg		
V11	6BL7GT	1.5meg	‡2700Ω	• 1700Ω	• 550K	• ‡4meg	175Ω	0Ω	.1Ω	
V12	6CG7	† 15K	2.3meg	820Ω	0Ω	.1Ω	† 82K	56K	820Ω	0Ω
V13	6DQ6A	0Ω	0Ω	0Ω	• † 8500Ω	820K	NC	.1Ω	0Ω	TOP CAP ‡37Ω
V14	6AX4GT	TP	NC	¶	NC	† 0Ω	TP	0Ω	.1Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡410Ω
V16	5U4GB	NC	¶	NC	37Ω	NC	34Ω	TP	¶	
V17	21DEP4	.1Ω	40K	550K	‡1meg	NC	NC	190K	0Ω	

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 280V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
■ MEASURED FROM 135V SOURCE.
NC NO CONNECTION.
TP TIE POINT.



START STRINGING WITH LARGE UHF PULLEY AT MAX. COUNTER-CLOCKWISE POSITION AND WITH SMALL DRIVE PULLEY PLASTIC SLEEVE TAB AT 3 O'CLOCK (VIEWED FROM FRONT OF TUNER)

UHF DRIVE CORD STRINGING

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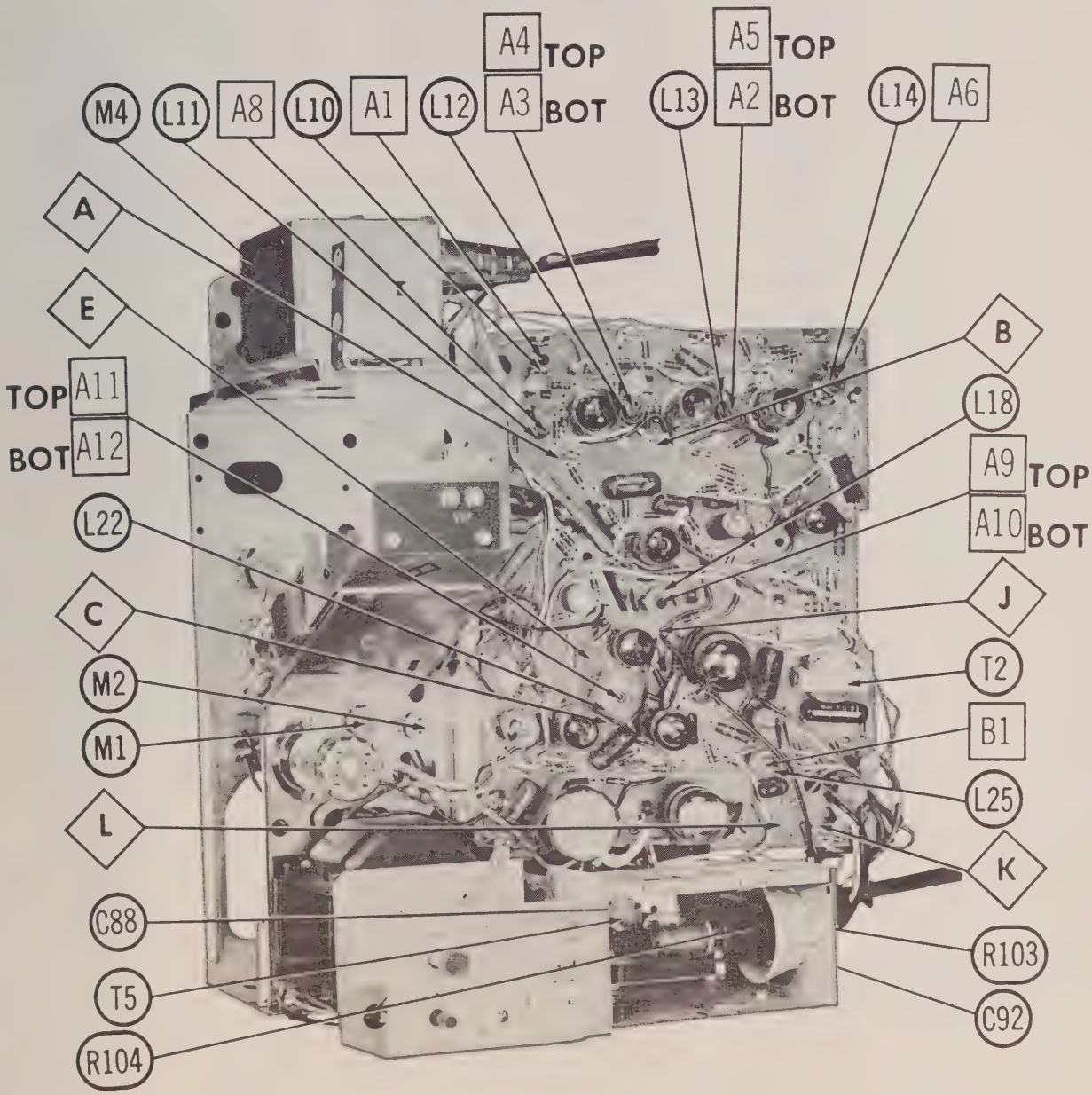
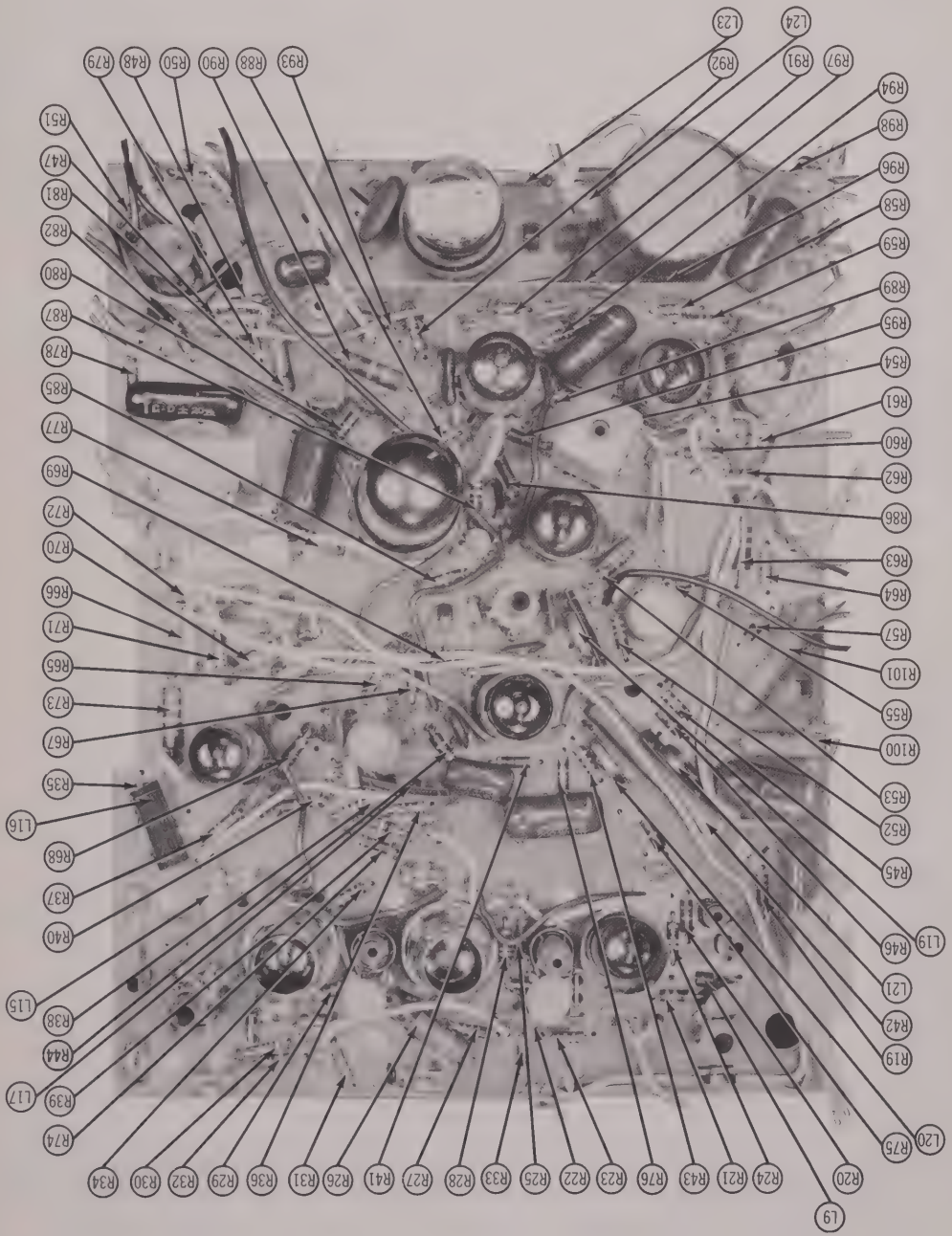
3924 MEADE ST.
DENVER, COLORADO



CHASSIS TOP VIEW

SET 387 FOLDER 2

RESISTOR AND INDUCTOR IDENTIFICATION



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BH8	
V2	Mixer-Oscillator	6U8	
V3	1st Video IF Amp	6CF8	
V4	2nd Video IF Amp	6CF8	
V5	3rd Video IF Amp	6CB6	
V6	Video Output-Noise Cancelator Control	6CX8	Note 1
V7	Sound IF Amp -Horiz AFC	6BW8	
V8	Ratio Det -AF Amp - Ald Clamper	6T8	

ITEM No	USE	TYPE	NOTES
V9	Audio Output	6AB5	
V10	Sync Sep.	6BY6	
V11	Vert Osc -Vert. Output	6BL7GT	
V12	Horiz. Mult.	6CG7	
V13	Horiz. Output	6DQ6A	
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GB	

Note 1. In chassis stamped EN-69 or higher a 1B3GTA is used to replace the video output and the triode section for the noise cancellor control is discontinued. NOTE: These tubes are not interchangeable.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: HOTPOINT PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V17	21DEP4 ① 21CZP4	21CZP4 ②	21DEP4 ③	1 Manufacturer recommends replacing with a 21CZP4 and ion trap (Part #8ET-GI7). 2 Aluminized 3 Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	HOTPOINT PART No	AEROVOX PART No	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	480	350	RCE-224	AFH6-99-50	D0789 4	FP41U9.87	TMQ-135		R2256 *
B	100	350							
C	480	300							
D	40	75							
C2	100	6	RCE-223 1	PR86V100	BBR10-6	TT6X100	TD-100-6	MTH-0610	TVA-4101
C3	4	50	RCE-226	PRB150V4	BBR4-50	TC50	TD-4-50	MT-0504	TVA-1403
C4A	60	200	RCE-271	PR3-025	BR6035			MTH-6530	R3483 *
B	10	200			SBR145			MMT-4501	
C5	40	450	RCE-222		BR4045	TC78	TD-40-450	MT-4540	TVA-1713

* Non-catalog item.
① Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	HOTPOINT PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C6	7.5		RCW-3373			C10V15C				NPO ①
C7	33		RCW-3318		TCZ-33	C10Q33C	TCO-33	ZT-5433	STCC-Q33	5% ②
C8	3.3		RCK-032	NPO-SI 3.3	TCZ-3R3	C10V33C	TCO-3 3	ZT-5533	STCCB-V33	5%
C9	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C10	330		RCW-3357		D6-331	L10T33	ED-330		MS-333	10%
C11	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C12	3-3		RCW-3080		S2S-3		S1S-D	CT585A		
C13	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C14	13		RCW-3269		TCZ-13	C10Q13C	TCO-13			5%
C15	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C16	1.8		RCK-017	NPO-SI 1.8		C10V15C				10%
C17	1.1		RCK-030	NPO-SI 1.0	TCZ-1	C10V15C	TCO-1			10%
C18	47		RCW-3297							N1500 5%
C19	1.8			NPO-SI 1.8		C10V15C				
C20	10000		RCW-3384	BPD-01	DD-103	BYA5SI	ED-01	DC5II	5HK-S1	
C21	5-3		RCY-080		S2S-3		S1S-D	CT585A		
C22	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C23	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C24	1000		RCW-3345	BPD-001	DD-102	BYA5DI	ED-1000	DC5SI	5HK-D1	
C25	25		RCW-3353		TCM-25	C10Q25D	TCT-25		STCCU-Q25	N750 5%
C26	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C27	91		RCK-012	NPO-SI 1.0	TCZ-4		TCO-4			10%
C28	10		RCW-3382							N470 5%
C29	15		RCW-3383							N330 a. 25mmf
C30	1000		RCW-3117	EF-001	MFT-1000				503C-D1	
C31	18		RCG-019		TCZ-18					NPO 5%
C32	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C33	.15	200	RCC-144	P288N-15		CUB2P15		GEM-3015	STM-P15	
C34	800		RCW-3037							
C35	680		RCW-3321		D6-681	L8ST68	ED-680		MS-368	10%
C36	68				TCZ-68		TCO-68		STCC-Q68	NPO 5%
C37	800		RCW-3037							
C38	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C39	330		RCW-3357		D6-331	L10T33	ED-330		MS-333	10%
C40	51		RCW-3278		TCZ-51		TCO-51			NPO 5%
C41	800		RCW-3037							
C42	930		RCW-3393			1R5T82	ED-930		MS-392	10%
C43	1200		RCW-3187			1R5D12	ED-1200		MS-312	10%
C44	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C45	800		RCW-3037							
C46	800		RCW-3037	BPD-0008	D[illegible]-801	L10T8	ED-[illegible]08		SGA-T8	
C47	800		RCW-3037	BPD-0008	[illegible]-801	L10T8	E[illegible]-0008		SGA-T8	
C48	800		RCW-3037	BPD-0008	DD-801	L10T8	ED-0008		SGA-T8	
C49	3		RCW-3286	NPO-DI 3.0		C10V3C	TCO-3			NPO
C50	5		RCW-3087		TCZ-4NT	C10V5C	TCO-5	ZT-525	STCCB-V4N	NPO 5%
C51	.047	200	RCC-140	P288N-047	DF-503	CUB2S47		GEM-2047	STM-S47	
C52	5000		RCW-3014	BPD-005	DD-502	[illegible]-A10D6	ED-005	DC525	5HK-D5	
C53	33		RCW-3351	NPO-DI 33	TCZ-33	C10Q33C	TCO-33	ZT-5433	STCC-Q33	NPO 10%
C54	47		RCW-3352	NPO-DI 47	TCZ-47	C10Q47C	TCO-47	ZT-5447	STCC-Q47	NPO 10%
C55	.15	400	RCC-144	P488N-15		CUB4P15		GEM-4015	4TM-P15	
C56	20000		RCW-3341	BPD-03	DD-203	BYB5E03	ED-03		5HK-E3	
C57	.22	200	RCC-146	P288N-23		CUB2P23		GEM-3022	STM-P22	
C58	5000		RCW-3014	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C59	20		RCW-3350		TCZ-20		TCO-20	ZT-543	STCC-Q3	NPO 5%
C60	1000		RCW-3385			IR5DI	ED-1000	MC5255	MS-SI	10%
C61	5000		RCW-3014	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C62	.015	200	RCC-135							10%
C63	10000		RCW-3186	BPD-01	DD-103	BYA5SI	ED-01	DC5II	5HK-S1	
C64	10000		RCW-3186	BPD-01	DD-103	BYA5SI	ED-01	DC5II	5HK-S1	
C65	10000	1000	RCW-3332	DAC-37		BYA10SI			5HL-S10	
C66	5000		RCW-3014	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C67	10000		RCW-3186	BPD-01	DD-103	BYA5SI	ED-01	DC5II	5HK-S1	
C68	1200		RCW-3187			1R5D12	ED-1200		MS-312	10%
C69	.015	600	RCN-068							10%
C70	.0005	600	RCW-3018	BPD-003	DD-203	BYA10D3	ED-003	DC522	5HK-D2	
C71	.1	600	RCC-141	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

CAPACITORS (cont)

ITEM No	RATING: CAP	VOLT	HOTPOINT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C72	.033	400	RCB-038							10%
C73	1	400	RCC-142	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C74	.01	1000	RCB-023							10%
C75	.033	1000	RCB-031							10%
C76	68		RCW-3354	N750-DI 68	TCH-68	C10Q68U	TCT-68		STCU-Q68	N750 10%
C77	56		RCW-3353		TCH-56	C10Q56U	TCT-56			N750 10%
C78	1200		RCW-3187			IR5DI2	ED-1200		MS-312	10%
C79	680		RCW-3321		D6-681	IR5T68	ED-680		MS-368	10%
C80	5000		RCW-3274	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C81	.1	200	RCC-141	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C82	.0056	600	RCC-145						GEM-16256	10%
C83	1000		RCG-004	1484-001		IR5DI	CY30C102J	MC5255	MS-SI	5%
C84	820		RCW-3383			IR5T82	ED-820			10%
C85	5000		RCW-3014	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C86	.1	400	RCC-141	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C87	470	1000	RCW-3285	RVD-1S-470	DD80-471	BYA10T47	HI5-470	DC30S47	5GA-T47	
C88	150	3000	RCW-3355							10% ④
C89	005	600	RCN-064							10%
C90	2200	1000	RCW-3356							10% ③
C91	10000	1000	RCW-3321	DAC-27		BYA10SI			5HL-S10	
C92	.27	200		P288N-25		CUB2P27		GEM-3027	2TM-P25	⑤
C93	5000		RCW-3014	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C94	.047	600	RCN-053	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	

① Early production uses a 6.8mmf, 5% (Part #RCW-3371) in this application.
② Early production uses a 47mmf, 5% (Part #RCW-3297) in this application.
③ Some versions may use a 250mmf, 4000V in this application
④ Not used in some versions.

CONTROLS

ITEM No	RATING: RESIST ANCE	WATTS	HOTPOINT PART No	CENTRALAB PART No	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	RRC-435	A5T-54	A47T2-500K		UDT-421	Volume- Tap ② 200K
B	Shaft			A1E-8	RS-3/16		DS-37	
C	Switch			SW1	SWT-12		UH-38	
R2A	300K	½	RRC-434	AB-S2	A47-300K-S	QH-151	U46	Vert. Hold
B	Shaft			A1E-8	RS-3/16	WQ	DS-37	
R3A	1E	2(WW)	RRC-433					Brightness
B	1TE	½	RRC-432					Contrast - Tap ① 6000Ω
R4A	1meg	½	RRC-391	B-69	A47-1meg-S	QH-137	TA16L	Horiz. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R5A	3meg	½	RRC-301	B-84	A47-3meg-S	QH-140	SU-59	Height
B	Shaft			Not Req.	FS8-1/4	TQ	Not Req.	
R6	3000Ω	2(WW)	RRC-305		39-3000			Vert. Linearity

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	HOTPOINT PART No	NOTES
R7	10K			
R8	2200Ω			
R9	330K			
R10	100Ω			
R11	820K			
R12	820K			
R13	4700Ω			
R14	22K			
R15	150K			
R16	10K			
R17	10K			
R18	10K			
R19	2.2meg			
R20	56000Ω			
R21	33Ω			
R22	68000Ω	2		
R23	6800Ω			
R24	47Ω			
R25	10K			
R26	56000Ω	2		
R27	68000Ω			
R28	470Ω			
R29	22K			
R30	4700Ω			
R31	2200			
R32	10000Ω			
R33	100Ω			
R34	180Ω			
R35	33000Ω 5%			
R36	8200Ω			
R37	82K		Note 1	
R38	240K 5%		Note 2	
R39	100K		Note 3	
R40	3.9meg			
R41	1meg		Note 3	
R42	5100Ω	7	RRW-178	Note 4
R43	33000Ω			Note 5
R44	68Ω			Note 6
R45	180Ω			
R46	10K			
R47	100K 5%			
R48	56K 5%			
R49	1meg			
R50	820K			
R51	1.8meg			
R52	3300Ω			
R53	180Ω			
R54	2200			
R55	22K			
R56	33K			
R57	22Ω			

ITEM No	RATING: OHMS	WATT	HOTPOINT PART No	NOTES
R58	3.3meg			
R59	470K			
R60	560K 5%			
R61	620K 5%			
R62	13K			
R63	330Ω	1		
R64	120Ω			
R65	22meg			Note 7
R66	18meg 5%			Note 7
R67	1meg			Note 7
R68	1.5meg			
R69	22K			
R70	47K	1		
R71	33K	1		
R72	33K	1		
R73	18K	1		
R74	3.3meg 5%			
R75	2.2meg			Note 8
R76	20meg 5%			
R77	390K			Note 9
R78	1.5meg			
R79	1.5meg			
R80	56000Ω			
R81	10000Ω	1		
R82	4700Ω			
R83	33000Ω			
R84	2200Ω			
R85	560K 5%			
R86	1meg			
R87	680K			
R88	100K			
R89	82K			
R90	15K	1		
R91	560 5%			
R92	1meg			
R93	82K			
R94	15K			
R95	6200 5%			
R96	100Ω			
R97	680K			
R98	100Ω	3	RRW-178	
R99	10K			
R100	7500Ω 5%	3	RRW-176	
R101	12K 5%	4	RRW-177	
R102	1meg-Cold 600K-Hot		RRW-175	
R103	680Ω	1		Note 7
R104	3.9Ω	1	RRE-003	
R105	470K	1		
R106	330K	1		
R107	470K			

Note 1. Some versions use a 68K in this application.
Note 2. Some versions use a 200K, 5% in this application.
Note 3. Some versions use a 330K in this application.
Note 4. Some versions use a 4200Ω, 10W (RRW-182) in this application.
Note 5. Some versions use a 6800Ω in this application.
Note 6. Some versions use a 16Ω in this application.
Note 7. Not used in some versions.
Note 8. Some versions use a 22meg, 5% in this application.
Note 9. Some versions use a 1.6meg in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: HOTPOINT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V	280VCT ② 340A	5V ③ 3A	25V tap ③ 6.3V 9.2A	RTP-339					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: HOTPOINT PART No	Halldorson PART No.	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T2	Vert Osc.	RTO-215	B6705 1 2	A-3004 1 2	V404 1 2	A-8126 1 3	26A03 1 3	A-120Z 1 2
T3	Vert. Output	RTO-216						
T4A	Yoke-Horiz. (12.6MH)	RLD-060		MDF-106				
B	(10°)-Vert. (43MH)							
T5	Horiz. Output	RTO-214-11		HVO-166				
	Alt. Horiz. Output	RTO-214		HVO-166				

1 Connect as autoformer
3 Connect yellow lead to junction of capacitor (C69) and resistor (R72), blue lead to pin 6 of V11. Connect red lead and green lead to ground.
2 Connect green lead to junction of capacitor (C69) and resistor (R72), red lead to pin 6 of V11. Connect blue lead and yellow lead to ground.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI	SEC	REPLACEMENT DATA: HOTPOINT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No	Triad PART No	NOTES
T8	5000Ω	3-4Ω	RTO-217	21D03	A-3019	A-8093	25H49	S-5Z	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: HOTPOINT PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	ROP-035 ①	4A07	① Used in all Models
	8"	PM	6-8Ω	ROP-045 ②		② Used in Models 21S507, 508, 555, 556, 605, 606

COILS (RF-IF)

ITEM No.	USE	HOTPOINT PART No.	NOTES
L1	VHF Ant. Trans.	RLA-050 *	
	VHF Ant Trans	RLA-053 ▲	
L2	Ant Coils	RSX-125 * Channel 2-13, Wafer Assy.	
	Ant. Coils	RSX-133 ▲ Channel 2-13, Wafer Assy.	
L3	RF Coils	RSX-123 Channel 2-13, Wafer Assy.	
L4	RF Interstage Coils	RSX-124 * Channel 2-13, Wafer Assy.	

ITEM No.	USE	HOTPOINT PART No.	NOTES
	RF Interstage Coils	RSX-132 ▲	Channel 2-13, Wafer Assy
L5	Mixer Grid Coils	RSX-132	Channel 2-13, Wafer Assy.
L6	Osc. Coils	RSX-121	Channel 2-13, Wafer Assy.
L7	RF Choke	RLL-390	
L8	Mixer Plate Coil	RLJ-403	

ITEM No.	USE	REPLACEMENT DATA: HOTPOINT PART No.	Messner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L9	IF Link Shunt	RLI-438			4680		.1 Microhenry Includes Cap.
L10	47.25MC Trap	RLI-441					
L11	1st. Video IF	RLI-341					Includes 41.25MC Trap Includes 47.25MC Trap Includes coils, caps, M3. 5.5 Microhenries. IRC Part #CL4
L12	2nd. Video IF	RTL-220					
L13	3rd. Video IF	RTL-219					
L14	4th Video IF Assy.	RTL-218					
L15	RF Choke	RLJ-349		19-1004	BC-585	6609	
L16	Shunt Peaking Coil	RLJ-194		19-3300	TV-300	6133	VP-7
L17	Series Peaking Coil	RLJ-342		19-3100	TV-195	6112	VP-4
L18A	4.5MC Trap	RLJ-440					
B	Sound IF						
L19	Shunt Peaking Coil	RLJ-343		19-3660	TV-306	6148	680 Microhenries-Note 1
L20	Shunt Peaking Coil	RLJ-343		19-3660	TV-306	6148	560 Microhenries-Note 2
L21	Series Peaking Coil	RLJ-353		19-4301	TV-187	6184	VP-5 200 Microhenries
L22	Ratio Det.	RTD-053			TV-147		Includes cap and resistor
L23	RF Choke	RLJ-153		19-1005	BC-586	6613	10 Microhenries. IRC Part #CL-1
L24	RF Choke	RLJ-153		19-1005	BC-586	6613	10 Microhenries, IRC Part #CL-1

Note 1. Chassis stamped "EN-69" or higher use part #RLJ-451 (560 Microhenries) in this application.
Note 2. Chassis stamped "EN-69) or higher use part #RLJ-452 (910 Microhenries) in this application
* Used in early production.
▲ Used in later production.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	SEC.	REPLACEMENT DATA: HOTPOINT PART No.	Messner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L25	70Ω		RLJ-439						

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~\	REPLACEMENT DATA: HOTPOINT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L26	.340A	54Ω	1.3 Hy.	RLF-080	C5040	C-2974 ①	C-2327	26C41	C-24X

① Drill new mounting hole.

HOTPOINT MODELS 21S406, 21S455, 21S456, 21S507, 21S508, 21S555, 21S556, 21S605, 21S606 (U2 Line)

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	HOTPOINT PART No.	REPLACEMENT DATA	
K1	De-emphasis	1000mmf, 15000mmf, 4000mmf, 27K	REK-022	Sprague	PB-3
K2	Sync Peaking	470mmf, 470K	RCR-003	Centralab Sprague	RC-465 R-9176

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			HOTPOINT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	4A 125V S/B	REF-034	RJB-089	333004. (N 4A 125V S/B)	346019	N4	HN 3½ to 5
M2	N	4/10A 250V S/B	REF-035	RJB-090	333.400 (N 4/10A 250V S/B)	364009	N 4/10	HN 3/10 to ½

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		HOTPOINT PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N87	RED-001	1N60	1N60	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	HOTPOINT PART No.	NOTES
M4	Tuner	RJX-109	VHF - 12 position, VHF Models
	Tuner	RJX-110	VHF - 13 position, UHF models
	Tuner	RUX-022	UHF - Used with VHF tuner RJX-110 in UHF models
M5	Centering Device	REA-019	
	Ion Trap	RET-017	Used with 21CZP4. Part #RET-018 used with some versions using 21DEP4
	Yoke Clamp	RMC-072	
	Motor	RBH-023	Power tuning, includes gears

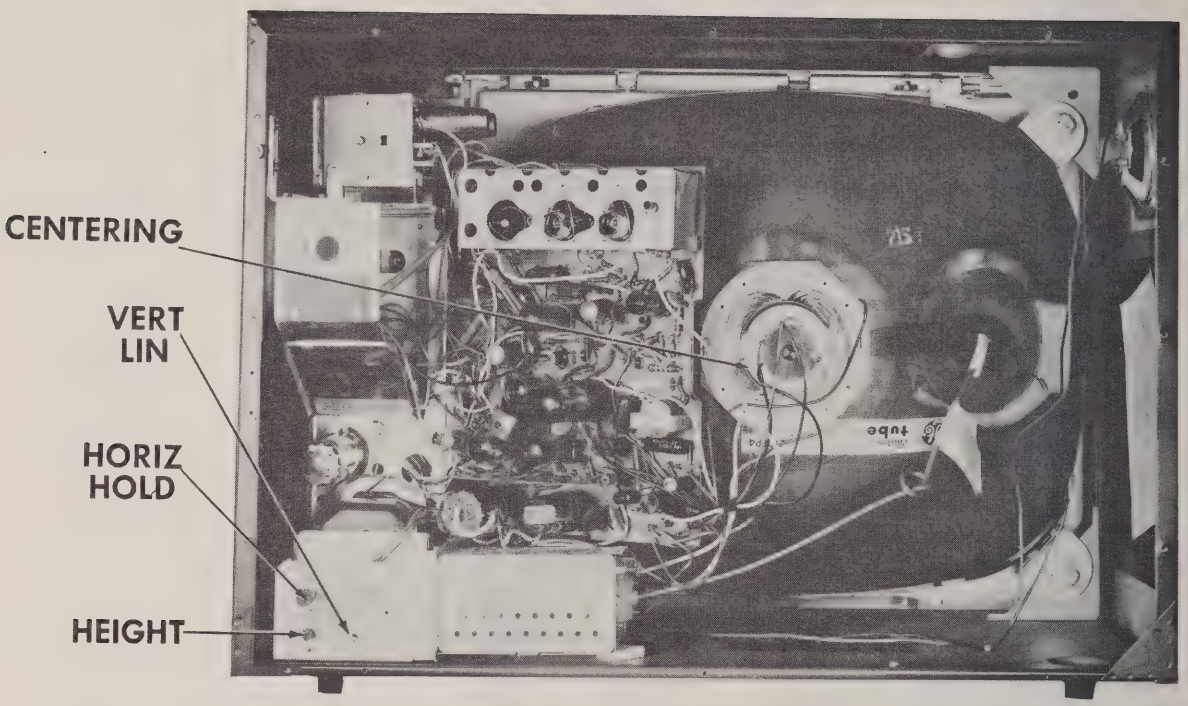
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	RDW-128	
Mask	HDM-002	Model 21S406
Mask	HDM-003	Models 21S507, 508
Mask	HDM-004	Models 21S455, 456, 555, 556, 605, 606
Knob	HDK-032	VHF Channel Selector - Model 21S406
Knob	HDK-037	VHF Channel Selector - Models 21S507, 508
Knob	HDK-029	VHF Fine Tuning - Model 21S406
Knob	HDK-034	VHF Fine Tuning - Models 21S507, 508
Knob	HDK-030	UHF Channel Selector - Model 21S406
Knob	HDK-035	UHF Channel Selector - Models 21S455, 456, 507, 508, 555, 556, 605, 606
Knob	HDK-027	UHF Indicator
Knob	HDK-031	On-off-volume & vertical - Model 21S406
Knob	HDK-036	On-off-volume & vertical - Models 21S455, 456, 507, 508, 555, 556, 605, 606
Knob	HDK-028	Contrast - Model 21S406
Knob	HDK-033	Contrast - Models 21S455, 456, 507, 508, 555, 556, 605, 606
Knob	RKD-655	Brightness
Cabinet	HAV-025	Model 21S406
Cabinet	HAV-028	Model 21S455
Cabinet	HAV-029	Model 21S456
Cabinet	HAV-030	Model 21S555
Cabinet	HAV-031	Model 21S556
Cabinet	HAV-034	Model 21S507
Cabinet	HAV-035	Model 21S508
Cabinet	HAV-036	Model 21S605
Cabinet	HAV-037	Model 21S606
Cabinet Leg	HAL-004	Model 21S507
Cabinet Leg	HAL-005	Model 21S508

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead from point ◇J◇ to chassis.

Shunt the horizontal frequency coil by connecting a 1000Ω resistor from point ◇K◇ to point ◇L◇. Adjust the horizontal hold control until the picture appears to flat back and forth across the screen.

Remove the 1000Ω shunt and adjust the horizontal frequency slug (B1) until the picture again appears to float back and forth across the screen. Remove the clip lead between point ◇J◇ and chassis.

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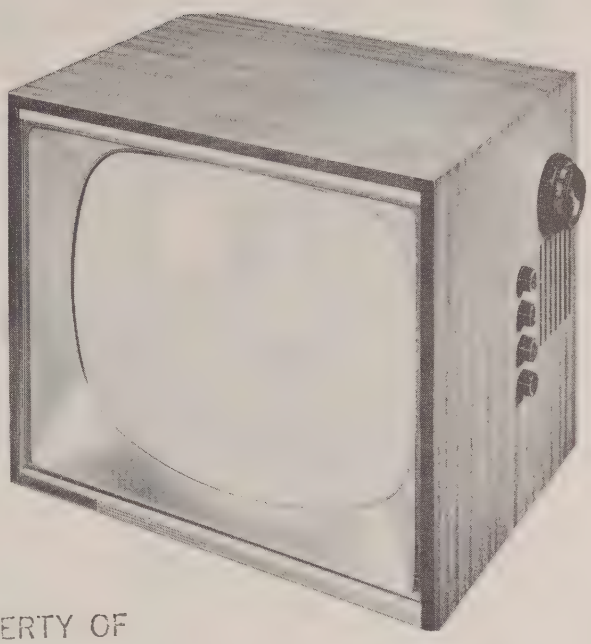

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type knobs from the side.
2. Remove 8 wood screws holding the rear cover. Remove the rear cover.
3. Remove 4 hex bolts holding the corners of the chassis.
4. Remove the chassis.

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TRADE NAME	Packard-Bell Model 17VT4 (Ch. V8-2)
MANUFACTURER	Packard-Bell Co.-Service Div., 11th. & Hope Streets, Los Angeles 15, Calif.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 145 Watts, 1.3 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. One slug for HIGH band adjustment is located at 11 o'clock, and should be adjusted first. The LOW band adjustment is located at 3 o'clock. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 wood screws from the bottom holding the lower trim strip. Remove the trim, pull the bottom of the glass out and down to remove.

SPECIAL ADJUSTMENTS

A. Picture Lock
Turn the picture lock control fully clockwise, then counter clockwise approximately 1/4 turn. Adjust picture to lock in with hold controls. If picture jitters, tears, etc. adjust picture lock counter clockwise until stable. Readjust hold controls and check operation on all channels in the area.

B. AGC
Observe the picture and advance the AGC control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

B. Focus
The focus may be varied by means of a focus control . (For location, see tube placement chart).

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

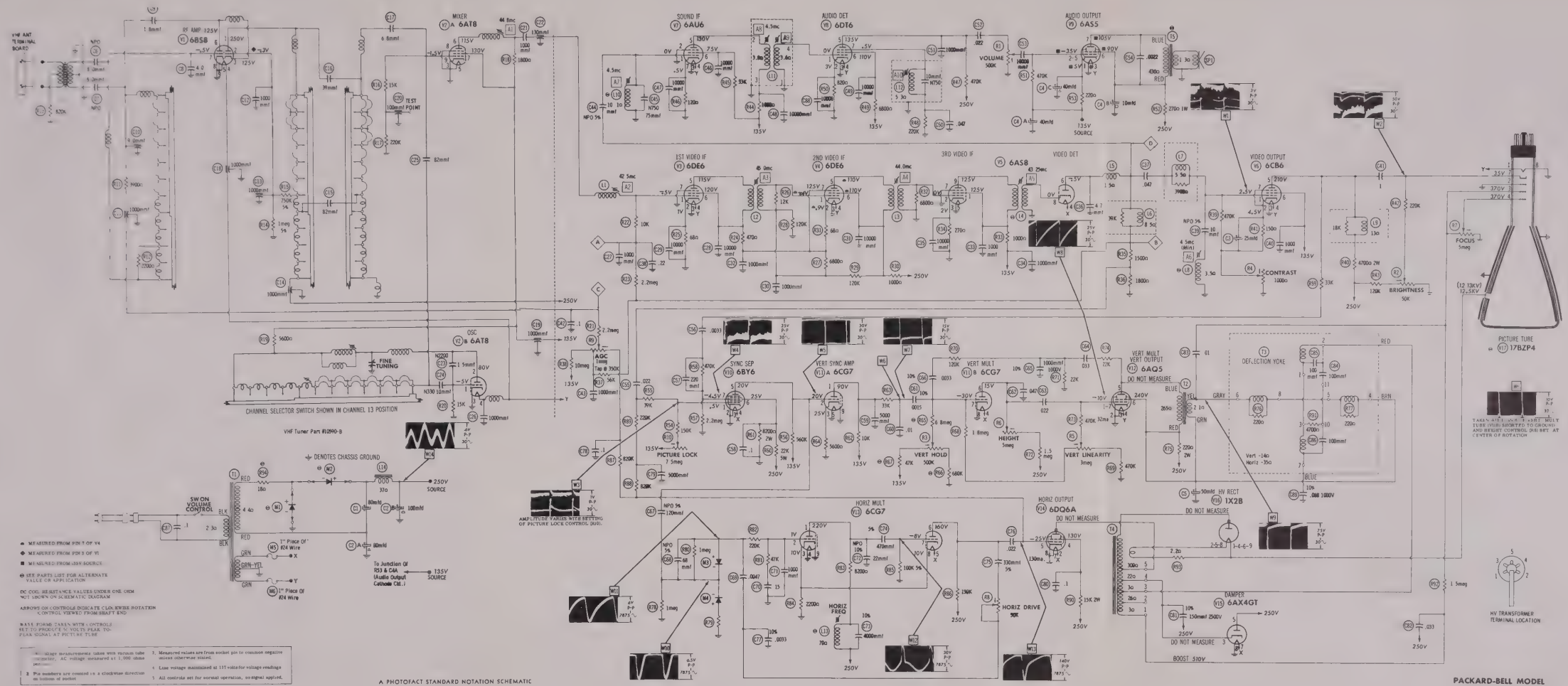
The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSE DEVICE

The filament circuit is protected by 2 fuse wires (M5, M6). For location see photo of "Chassis Bottom View-Capacitor and Alignment Identification" pages 4 and 9.

PACKARD-BELL MODEL
17VT4 (Ch. V8-2)

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana . Printed in U.S. of America



- MEASURED FROM PIN 7 OF V4
- MEASURED FROM PIN 3 OF V1
- MEASURED FROM -135V SOURCE
- SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

BASE FORMS TAKEN WITH CONTROLS SET TO PRODUCE ½ VOLTS PEAK TO-PEAK SIGNAL AT PICTURE TUBE

1. Voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

TUBE PLACEMENT CHART

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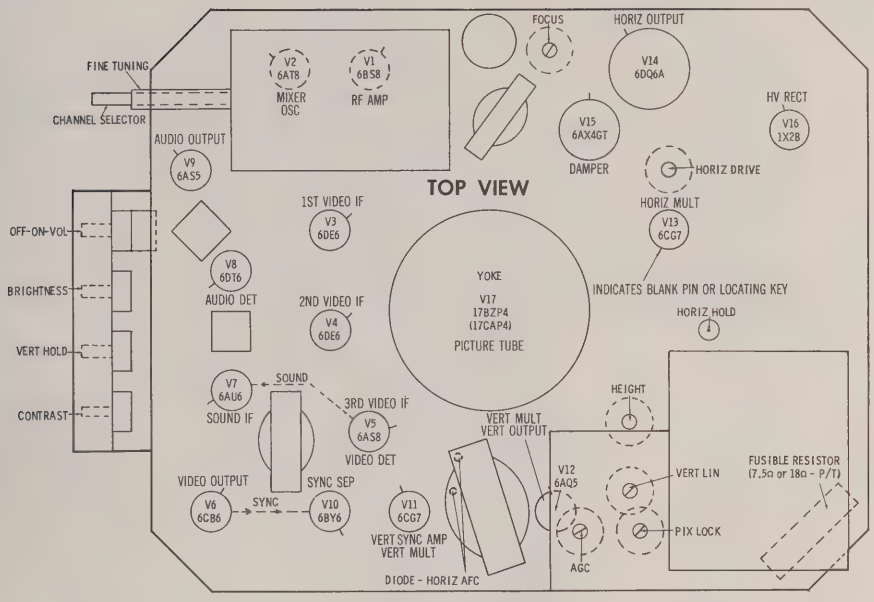

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse Wire (M5, M6), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V9**
No pic, no sound, has snow - **V1, V2, V3, V9**
No pic, has sound, has raster - **V6, V17, V9**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10, V11, V9**
No horiz. sync - **V10, V11, Rectifier (M3, M4), V9**
No vert. or horiz. sync - **V10, V11, V9**

SWEEP FAILURE
No raster, has sound - **M3, M4, V13, V14, V15, V16, V17**
No vertical deflection - **V11, V12**
Poor vert. linearity or foldover - **V11, V12**
Poor horiz. linearity or foldover - **V13, V14, V15**
Narrow picture - **V13, V14, V15, M1, M2**
Vert. off freq. - **V11, V12**
Horiz. off freq. - **V13**

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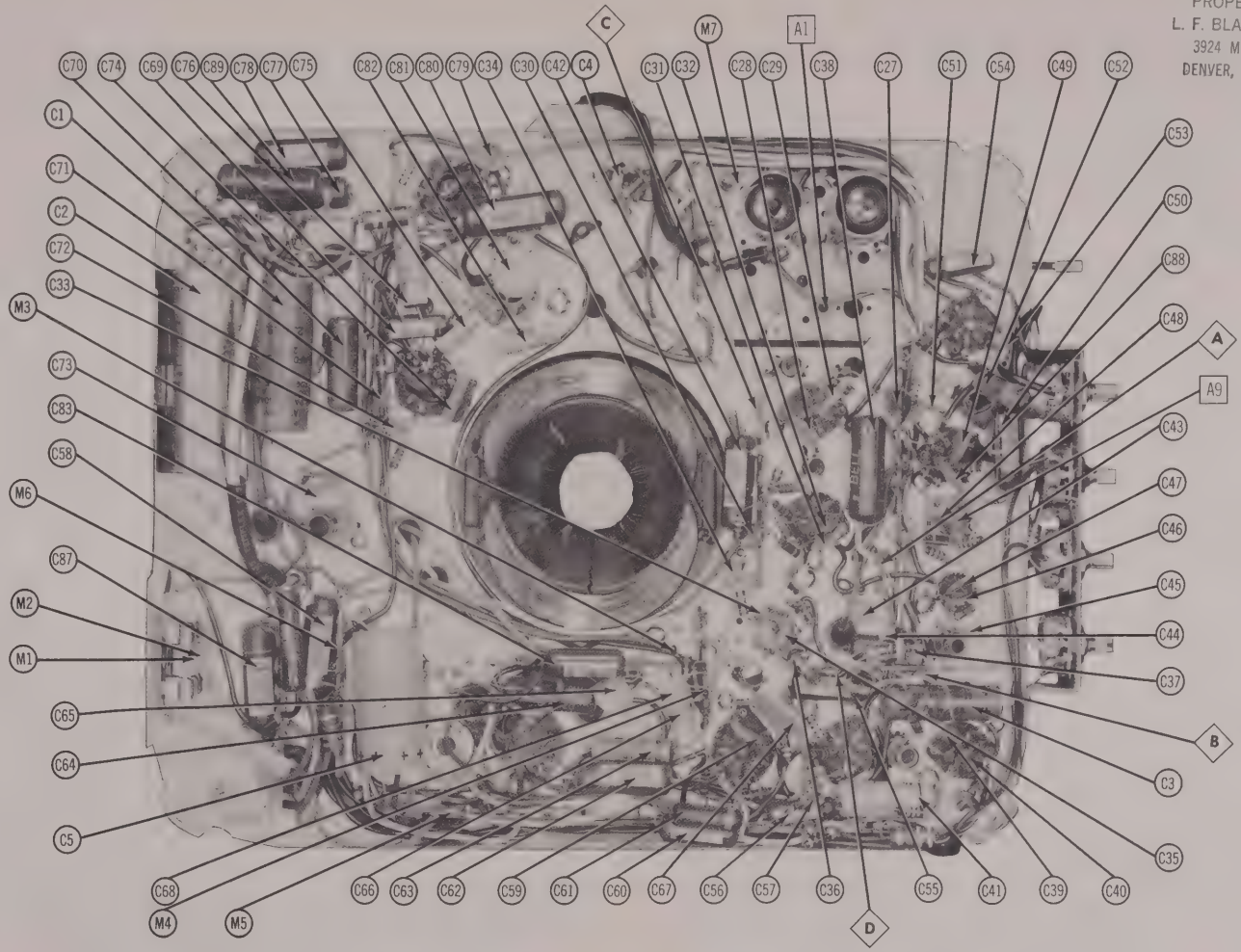


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

After connecting test equipment as in step 1, adjust generator output to provide approximately -1.5 to -2 volts at point (A).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001mfd	High side to ungrounded tube shield floating over mixer-osc. tube (V2). Low side to chassis.	44.8MC (Unmod)	Any non-interfering channel	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	42.5MC	"	"	A2	"
3.	"	"	45.0MC	"	"	A3	"
4.	"	"	44.0MC	"	"	A4	"
5.	"	"	43.25MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 5mfd, 50 volt capacitor to point (A). Connect positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	41.25MC 43.3MC 45.0MC 45.75MC	3	Vert. Amp. thru 22K to point (B). Low side to chassis.		Adjust sweep generator output to develop -3 volts at point (A). Adjust AGC control so that voltage at point (C) is the same as at point (A). If necessary, readjust sweep output so that voltage at point (A) is again -3 volts. Connect separate marker generator to ungrounded tube shield floating over mixer-osc. tube (V2). Check for response similar to Fig.1 with markers as shown. Retouch A2 for correct overall bandwidth. Retouch A1 to place 45.75MC marker at 50%. Adjust A3 for correct placement of 45.0MC marker. Retouch A2 and A5 for correct position of 41.25MC and 43.3MC markers. NOTE: 45.0MC marker must not exceed 97% on channel 3 or picture may smear on higher channels.

4.5MC TRAP ALIGNMENT

If a 4.5MC signal generator of crystal accuracy capable of at least one volt output is not available, tune in a TV station and adjust A6 for MINIMUM 4.5MC beat interference in the picture.
Turn the contrast control fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001mfd	High side to point (D). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 7 (cathode) of picture tube. Common to chassis.	A6	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to point (D). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru detector probe to pin 7 (screen grid) of the 6DT6 (V8). Common to chassis.	A7, A8, A9, A10	Reduce signal input to zero and detune A10 until the meter reading dips to zero. Increase signal input until an indication is obtained on the VTVM. Adjust A7 and A8 for maximum deflection. Reduce signal input to a low level and adjust A9 for maximum deflection. If A9 does not tune, or has a broad tuning peak, reduce signal until sharp tuning is obtained. Remove generator and tune in a TV station. Adjust A10 for best sound. It may be necessary to retouch A9 for best sound on a very weak station signal.

TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

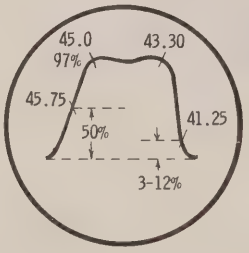
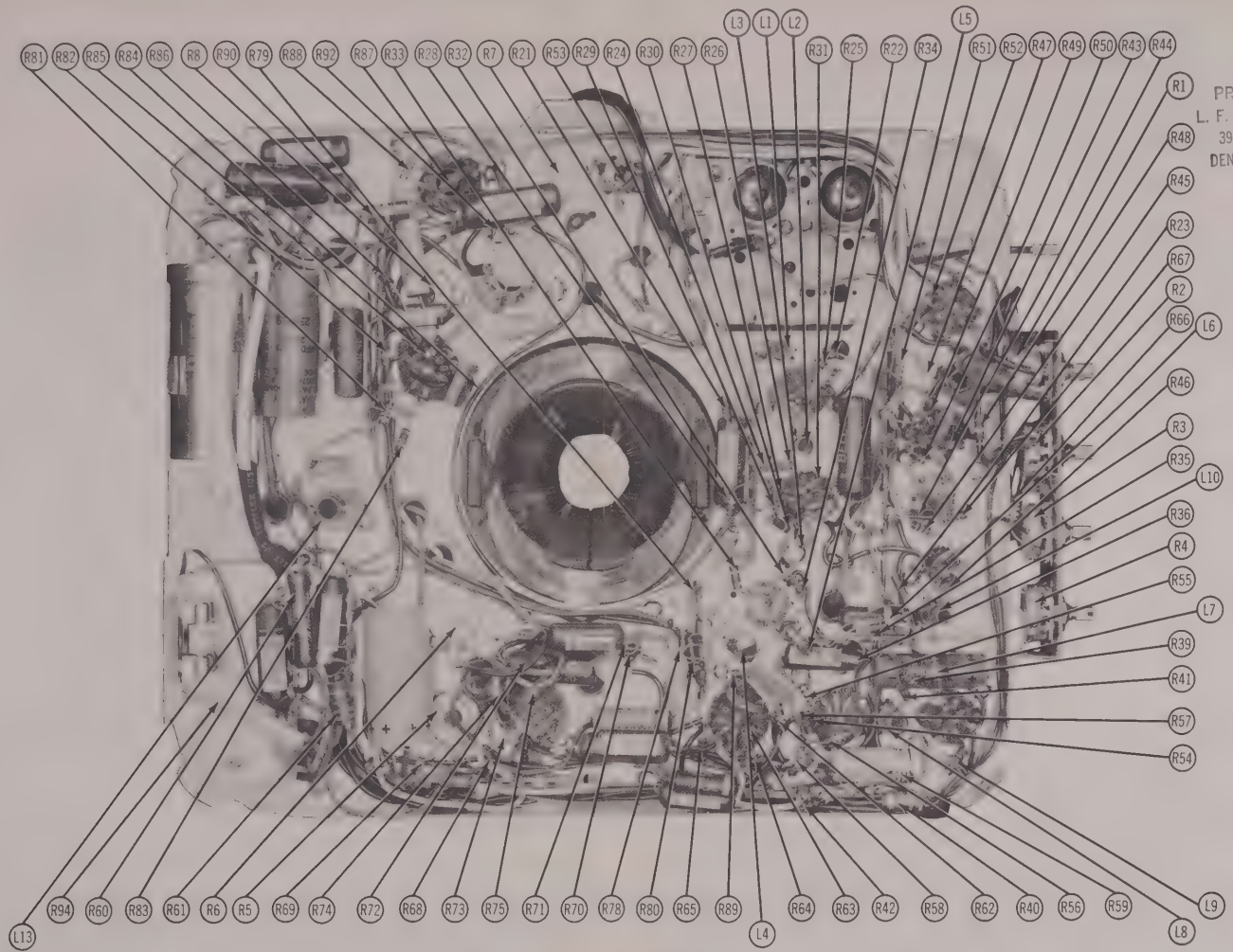


FIG. 1

CHASSIS TOP VIEW

PACKARD-BELL MODEL
17VT4 (Ch. V8-2)



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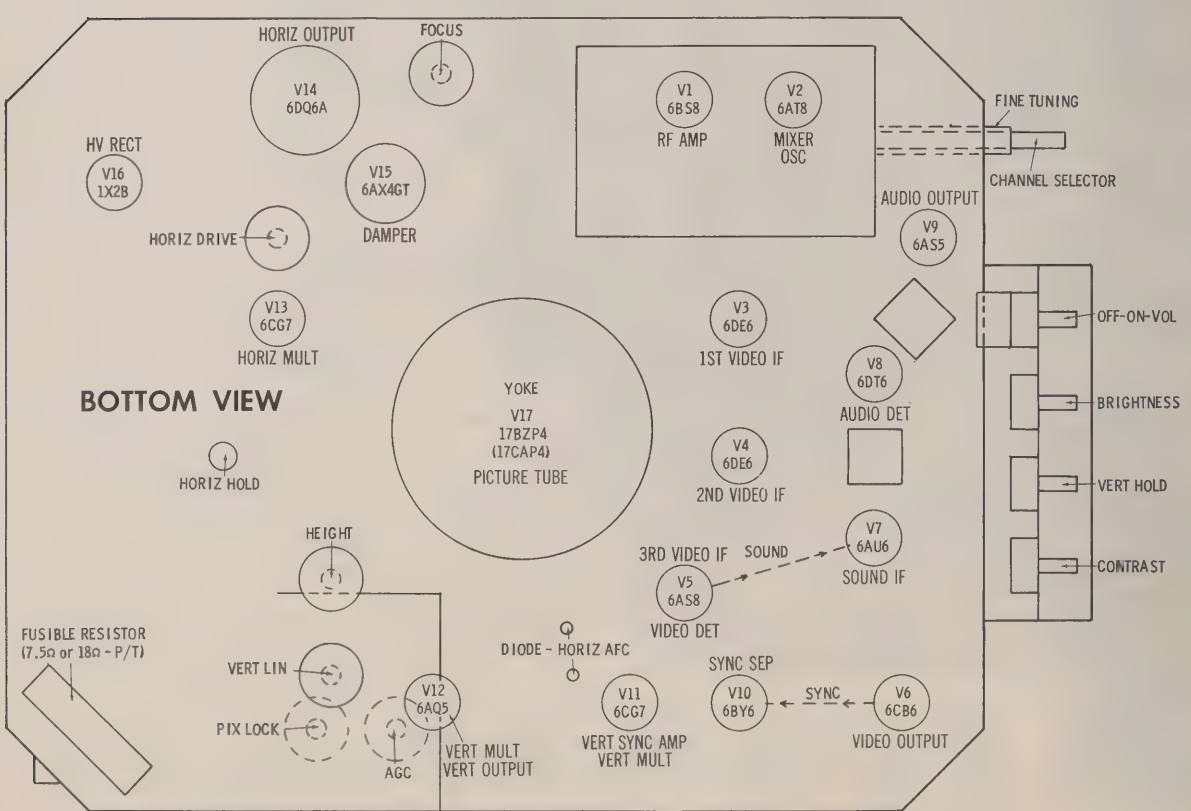
CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	†0Ω	420K	INF	.1Ω	0Ω	INF	• 2.4meg	0Ω	0Ω
V2	6AT8	15K	■5600Ω	0Ω	.1Ω	0Ω	■18K	■ 0Ω	0Ω	235K
V3	6DE6	2.2meg	68Ω	0Ω	.1Ω	▲ 470Ω	▲ 470Ω	0Ω		
V4	6DE6	▲ 6800Ω	▲ 68Ω	0Ω	.1Ω	†1000Ω	†1000Ω	65K		
V5	6AS8	■ 1000Ω	.1Ω	270Ω	.1Ω	0Ω	3300Ω	0Ω	.1Ω	■ 1000Ω
V6	6CB6	470K	• 400Ω	0Ω	.1Ω	†4700Ω	■ 0Ω	• 400Ω		
V7	6AU6	1Ω	0Ω	0Ω	.1Ω	■1000Ω	■ 33K	120Ω		
V8	6DT6	3.6Ω	820Ω	0Ω	.1Ω	†470K	■ 6800Ω	220K		
V9	6AS5	■ 220Ω	■ 470K	.1Ω	0Ω	■470K	†270Ω	†840Ω		
V10	6BY6	• ■170K	0Ω	0Ω	.1Ω	■560K	†17K	2.2meg		
V11	6CG7	■ 10K	■ 560K	5600Ω	.1Ω	0Ω	• †3.4meg	• 2.7meg	0Ω	0Ω
V12	6AQ5	• 1.9meg	0Ω	0Ω	.1Ω	†485Ω	†220Ω	• 1.9meg		
V13	6CG7	†8200Ω	1.1meg	2200Ω	0Ω	.1Ω	†150K	100K	2200Ω	0Ω
V14	6DQ6A	TP	.1Ω	TP	†15K	620K	TP	0Ω	0Ω	TOP CAP ‡22Ω
V15	6AX4GT	NC	NC	5meg	NC	†0Ω	NC	.1Ω	0Ω	
V16	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡322Ω
V17	17BZP4	0Ω	0Ω	‡1.5meg	• ‡1.7meg	NC	NC	• 240K	.1Ω	

- • THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
- ▲ MEASURED FROM PIN 7 OF V4.
- † MEASURED FROM 250V SOURCE.
- ‡ MEASURED FROM PIN 3 OF V15.
- ■ MEASURED FROM 135V SOURCE.
- NC NO CONNECTION.
- TP TIE POINT.



TUBE PLACEMENT CHART

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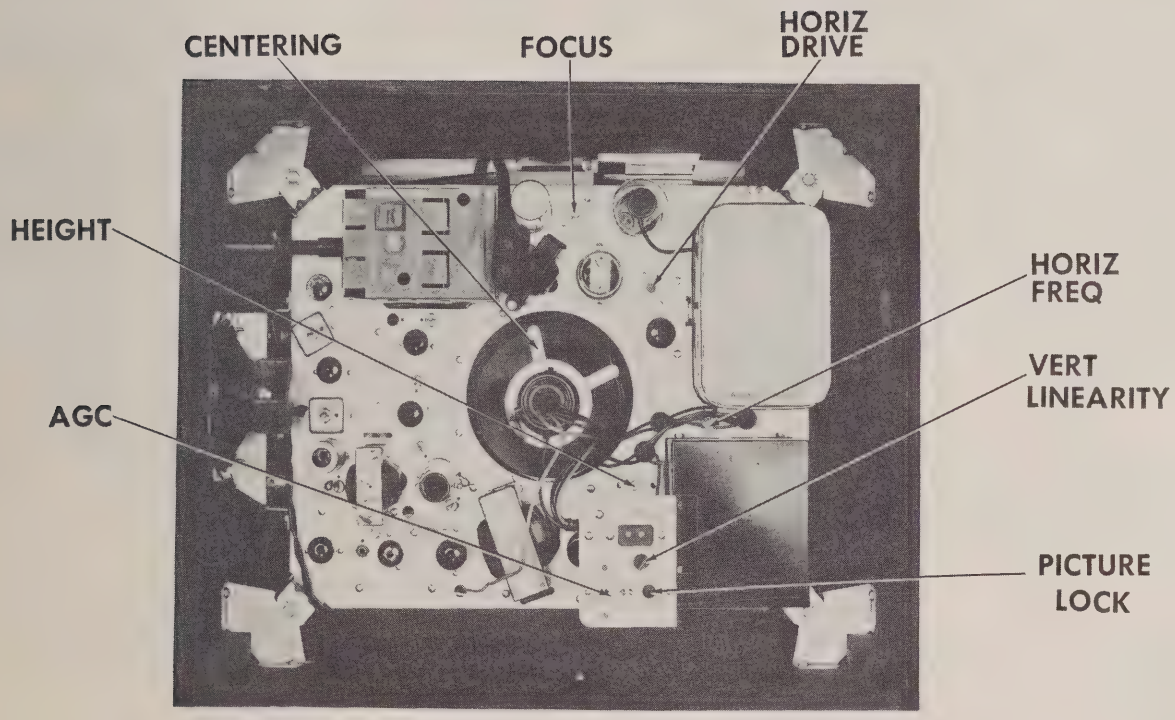


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive control (R8) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	6BS8	
V2	Mixer-Oscillator	6AT8	
V3	1st. Video IF Amp	6DE8	
V4	2nd Video IF Amp	6DE8	
V5	3rd Video IF Amp - Video Det.	6AS8	
V6	Video Output	6CB6	
V7	Sound IF Amp	6AU8	
V8	Audio Det.	6DT8	
V9	Audio Output	6AS5	
V10	Sync Sep.	6BT8	
V11	Vert. Sync Amp. - Vert. Mult.	6CQ7	
V12	Vert. Mult. - Vert. Output	6AQ8	
V13	Horiz. Mult.	6CQ7	
V14	Horiz. Output	6DQ6A	
V15	Damper	6AX4GT	
V16	HV Rectifier	1X22	

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	Packard-Bell PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V17	17BZP4	17BZP4 1	17BP4A 2	1 Aluminized 2 Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Packard-Bell PART No	AEROVOX PART No	CORNELL-DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	80	175	34139	PRS450V80	BR8035	TC492	TD-80-350	MT-4580	R2543 *
C2A	±80	175	34140	AFH2-85-88	C0878	FP931.5	TMD-189	Q-188 MT-3530	R2541 *
B	±100	350						MT-3530	
C3	25	25	24008	PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C4A	40	200	34109	AFH3-124-80	CGQ750 BBU345			D-115 MT-4510	R2284 *
B	±40	350							
C	±40	350							
C5	50	350	34141	PRS350V50	BR5035	TC79	TD-50-450	MT-4550	TVA-1173

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	5.0					C10V5C				NPO
C7	9.0					C10V9C				NPO
C8	4.0					C10V4C				
C9	1.8									
C10	9.0									
C11	.1000			EF-001	MFT-1000					503C-D1
C12	.1000			BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	SHK-D1
C13	.1000			EF-001	MFT-1000					503C-D1
C14	.0000			EF-001	MFT-1000					503C-D1
C15	.82									
C16	.39									
C17	8.8			NPO-SI 8.8	TCZ-8R8	C10V8C	TCO-8.8	ZT-5588		BTCCB-V88
C18	.1000			EF-001	MFT-1000					503C-D1
C19	.1000			EF-001	MFT-1000					503C-D1
C20	.100			EF-001	MFT-100					503C-T1
C21	.1000			BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	SHK-D1
C22	.130									
C23	1.5									N1500
C24	10									N330
C25	.82									
C26	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C27	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C28	.10000		23859	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C29	.10000		23859	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C30	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C31	.10000		23859	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C32	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C33	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C34	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C35	.10000		23859	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C36	4.7		23752	NPO-SI 4.7	TCZ-4R7	C10V47C	TCO-4.7	ZT-5547		BTCCB-V47
C37	.047	200	23106	P288N-047	DF-503	CUB2347		GEM-6147		FTM-S47
C38	.22	200	23109	P288N-22		CUB2P22		GEM-2022		FTM-P22
C39	10		23927	NPO-DI 10	TCZ-10	C10Q1C	TCO-10	ZT-541		BTCC-Q1 NPO 5%
C40	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C41	1	400	23136	P488N-1	DF-104	CUB41P1		GEM-401		4TM-P1
C42	1	200	23107	P288N-1	DF-104	CUB2P1		GEM-301		FTM-P1
C43	1.000		23960	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C44	10		23927	NPO-DI 10	TCZ-10	C10Q1C	TCO-10	ZT-541		BTCC-Q1 NPO 5%
C45	75			N750-DI 75	TCU-75	C10Q75U	TCT-75	ZT-5475		BTCU-Q75 N750
C46	.10000		23939	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C47	.10000		23939	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C48	.10000		23939	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C49	.10000		23939	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C50	.047	200	23106	P288N-047	DF-503	CUB2347		GEM-6147	FTM-S47	
C51	.1000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C52	.022	600	23141	P688N-022	DD-302	CUB6S22	ED-02	GEM-6122	6TM-S22	
C53	.10000		23939	BPD-01	DD-103	BYA501	ED-01	DC511	SHK-S1	
C54	.0022	600	23135	P688N-0022	D6-322	CUB1D22	GP-2200	GEM-6222	6TM-D22	
C55	.022	400	23122	P488N-022	DD-303	CUB4S22	ED-02	GEM-6122	4TM-S22	
C56	.0033	400	23117	P488N-0033	D6-332	CUB6D33	GP-3300	GEM-6133	6TM-D22	
C57	.220		23915	BPD-00022	DD-32	L10T22	ED-220	UC-5322	SCA-T22	
C58	1	200	23107	P288N-1	DF-104	CUB2P1		GEM-301	FTM-P1	
C59	5000		23931	BPD-005	DD-502	BYA5D5	ED-005	DC535	SHK-D5	
C60	.01	600	23139	P688N-01	D6-103	CUB6S1	GP-10000	GEM-6110	6TM-S1	
C61	.0015	400	23315					GEM-6152		10%
C62	.047	600	23143	P688N-047	DF-503	CUB6S47		GEM-6215	6TM-S47	
C63	.022	600	23141	P688N-022	DD-303	CUB6S22	ED-02	GEM-6147	6TM-S22	
C64	.033	600	23142	P688N-033	DF-303	CUB6S33		GEM-6122	6TM-S33	
C65	.1000	1000	23753							10%
C66	.0033	400	23317					GEM-16233		10%
C67	120		23921		TCZ-120	C10T12C	TCO-120		STCC-T12	NPO 5%
C68	68		23962		TCZ-68	C10Q68U	TCT-68		STCC-Q68	NPO 5%
C69	.0047	600	23137	P688N-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C70	.15	200	23106	P288N-15		CUB2P15		GEM-1015	FTM-P15	
C71	.2000		23860	BPD-001	DD-102	BYA501	ED-1000	DC521	SHK-D1	
C72	23		23906	NPO-DI 23	TCZ-23	C10Q23C	TCO-23		STCC-Q23	NPO 10%
C73	.4000		23206	1464-004		1W504		MC9463	MS-34	10%
C74	470		23236	1464-00047		SR5T47	CY15C47UJ		MS-347	5%
C75	330		23233	1469-00033		SR5T33	CY15C33UJ		MS-333	5%
C76	.022	600	23141	P688N-022	DD-303	CUB6S22	ED-02	GEM-6122	6TM-S22	

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Packard-Bell PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	ERIE PART No	MALLORY PART No	SPRAGUE PART No	NOTES
C77	.0033	400	23317		P688N-1	DF-104	CUB4P1		GEM-16233	10%
C78	.1	200	23107		P288N-1	DF-104	CUB2P1		GEM-201	5TM-P1
C79	5000		23931		BPD-006	DD-502	BYA5D26	ED-005	DC535	5HK-D5
C80	.1	600	23146		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1
C81	150	1600	23909		P688N-033	DF-303	CUB6S33		GEM-8153	6TM-S33 10%
C82	.033	600	23143		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1
C83	.01	600	23139							
C84	.100									
C85	100									
C86	100									
C87	1	600	23745		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1
C88	10000		23939		BPD-01	DD-103	BYA5S1	ED-01	DC511	5HK-S1
C89	.068	1000	23073							10%

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No	INSTALLATION NOTES	
R1A	500K	½	25903 A	S-80-S	A47-509K-Z	QI3-133	U48	Volume	
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.		
C	Switch			Not Req.	SWE-12	TB-1	U8-38		
R2A	50K	½	25906 A	B-31	A47-501K-B	QI1-133	U39	Brightness	
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.		
R3 A	500K	½	25960 A	B-59	A47-500K-B	QI1-133	U50	Vert. Hold	
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.		
R4	1000	½	25904 A	B-508		QI7-108	U3	Contrast	
R5 A	3meg	½	25867	AB-84	A47-3meg-S	QI1-140	TA38-L	Vert. Linearity	
B	Shaft			AK-1	FK31-1/4	Not Req.	Not Req.		
R6 A	5meg	½	25910	AB-87	A47-5meg-S	QI1-114	PTA56L	Height	
B	Shaft			AK-1	FK31-1/4	Not Req.	Not Req.		
R7A	5meg	½	25810	AB-87	A47-5meg-S	QI1-104	PTA56L	Focus	
B	Shaft			AK-1	FK31-1/4	Not Req.	Not Req.		
R8A	50K	½	25908	BX-31	A47-501K-S	QI1-23	PTA54L	Horiz. Drive	
B	Shaft			Not Req.	FK31-1/4	Not Req.	Not Req.		
R9	1meg	½	25815	BT-73		QI1-143	UT-426	AGC - Tap @ 350K	
R10A	7.5meg	½	25811	AB-88	A47-7.5Meg -S	QI1-142	PTA78L	Pix Lock	
B	Shaft			AK-19	RN-3	Not Req.	Not Req.		

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Packard-Bell PART No	NOTES
	OHMS	WATT		
R11	3900Ω		73017	
R12	2200Ω		73081	
R13	630K		73085	
R14	1meg 5%		73056	
R15	750K 5%		73055	
R16	18K		73157	
R17	220K		73043	
R18	1800Ω		73050	
R19	560Ω		73046	
R20	15K		73086	
R21	2.2meg		73186	
R22	10K		73037	
R23	2.2meg		73165	
R24	270Ω		73021	
R25	68Ω		73011	
R26	12K		73038	
R27	6800Ω		73035	
R28	130K		73060	
R29	180K		73060	
R30	100Ω		73025	
R31	68Ω		73011	
R32	6800Ω		73035	
R33	1000Ω		73025	
R34	270Ω		73021	
R35	1500Ω		73027	
R36	1800Ω		73029	
R37	56K		73046	
R39	10meg		73073	
R39	470K		73157	
R40	4700Ω	2	73433	
R41	150Ω		73015	
R42	220K		73153	
R43	120K		73050	
R44	1000Ω		73025	
R45	33K		73043	
R46	130K		73014	
R47	470K		73057	
R48	220K		73153	
R49	6800Ω		73035	
R50	820Ω		73024	
R51	470K		73157	
R52	270Ω	1	73218	

ITEM No.	RATING		Packard-Bell PART No	NOTES
	OHMS	WATT		
R53	220Ω		73017	
R54	150K		73081	
R55	39K		73044	
R56	560K		73058	
R57	2.2meg		73155	
R58	470K		73157	
R59	33K		73043	
R60	22K	2	73450	
R61	8200Ω	2	73436	
R62	10K		73037	
R63	33K		73043	
R64	5600Ω		73034	
R65	6.8meg		73071	Note 1
R66	680K		73059	Note 2
R67	47K		73045	
R68	1.5meg		73064	
R69	470K		73057	
R70	120K		73050	
R71	22K		73041	
R72	1 5meg		73063	
R73	470K		73057	
R74	22K		73041	
R75	220Ω	2	73417	
R76	220Ω			
R77	220Ω			
R78	1meg		73081	
R79	560Ω		73022	
R80	1meg		73081	
R81	47K		73045	
R82	220K		73153	
R83	2200Ω		73029	
R84	2200Ω		73029	
R85	100K 5%		73040-1	
R86	150K		73081	
R87	820K		73060	
R88	820K		73060	
R89	220K		73153	
R90	15K	2	73439	
R91	47000			
R92	1.5meg		73063	
R93	2 2M		73719	
R94	180		73724	

Note 1. Some versions use a 4.7meg (Part #73069) in this application.
Note 2. Some versions use a 270K (Part #73054) in this application.
Note 3. Some versions use a 220K (Part #73053) in this application.
Note 4. Versions using selenium rectifiers use a 7.5Ω (Part #73720) in this application.

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	Packard-Bell PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117V	115V	12.6VCT		28064					
	@1.3 A	@ .260 A	@4.2A							

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		Packard-Bell PART No.	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T2	Vert. Output	28480							
T3A	Yoke-Horiz. (17.8MH)	29645C							
B	(10M)-Vert. (15MH)								
M8	Rear Cov er & Centering Device	34071							
T4	Horiz. Output	894799						HO-290 *	

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTION	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5				5		
4				4		
3				3		
1				1		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T9	5800Ω	3-4Ω	28934-C	Z1107	A-2930	A-3877	24S51	S-5Z 2	1 Alt. part number
	4700Ω	3-4Ω	28436-A 1	Z1107	A-2930	A-3S80	24S51	S-3Z	2 Drill new mounting hole

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.		Packard-Bell PART No.	QUAM PART No	
SP1	4"	PM	3-4Ω		53G14	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Packard-Bell PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	1st. Video IF	29584	17-4534	TV-131		VF-4	
L2	2nd. Video IF	29585	17-4533	TV-130		VF-3	
L3	3rd. Video IF	29585	17-4533	TV-130		VF-3	
L4	4th. Video IF	29587	17-4532	TV-120		VF-2	Note 1
L5	RF Choke	29566	19-1005	BC-506	4812		10 Microhenries
L6	Shunt Peaking Coil	29606	19-6180	TV-183	6179	VP-8*	180 Microhenries, wound on 39K resistor
L7	Series Peaking Coil	29562	19-3203 ▲	TV-181 ▲	6177 ▲	VP-5 ▲	93 Microhenries, wound on 39000 resistor
L8	4.5MC Trap	29548	17-3402 †		1470		Note 2
L9	Shunt Peaking Coil	29577	19-4400 +	TV-202 +	6136 +		400 Microhenries, wound on 18K resistor
L10	1st. Sound IF	29033	20-1004	TV-151	1469	SF-3	Note 3
L11	2nd. Sound IF	29080D	20-1005				
L12	Quadrature Coil	29081	20-1005	TV-134	1480		Includes cap.

* Parallel 39K resistor.
▲ Parallel 39000 resistor
Note 1. Alternate part #29587 may be used in some versions.
Note 2. Alternate part #29548A may be used in some versions.
Note 3. Alternate part #29015B may be used in some versions.
† Disregard tap.
+ Parallel 18K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI	SEC	Packard-Bell PART No	Meissner PART No	Merit PART No	Miller PART No	Ram PART No	Thordarson PART No	
L13	70Ω	39Ω	29595	19-1576	TV-163	6210	H-102	HS-5	Note 1

Note 1 Alternate part #29595A may be used in some versions

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT (000 C_{dc})	Packard-Bell PART No	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
L14	250 A	37Ω	1 Hy.	27006B	C-5037 1	C-2898 1	C-3258 1	28C44 1	C-34X	

1 Drill new mounting hole.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Maximum)	Packard-Bell PART No.	FEDERAL PART No	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.260A	72025 ① ③	1363 A ②		MR300 ① 3S81 ①	300 ① M300 ①	① Silicon type. ② Alt. Selenium type part #72026
M3	.260A	72025 ① ③	1363 A ①		MR300 ③ 3S81 ①	300 ③ M300 ①	③ Selenium type.
M3		72017 ③	1215 ③		1T1 ③		
M4		72017 ③	1215 ③		1T1 ③		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Packard-Bell PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M5		1" of #24 wire						
M6		1" of #24 wire						

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M7	Tuner	10590B	VHF
	Tuner	10590A	VHF
M8	Centering Device	34071	Includes yoke cover

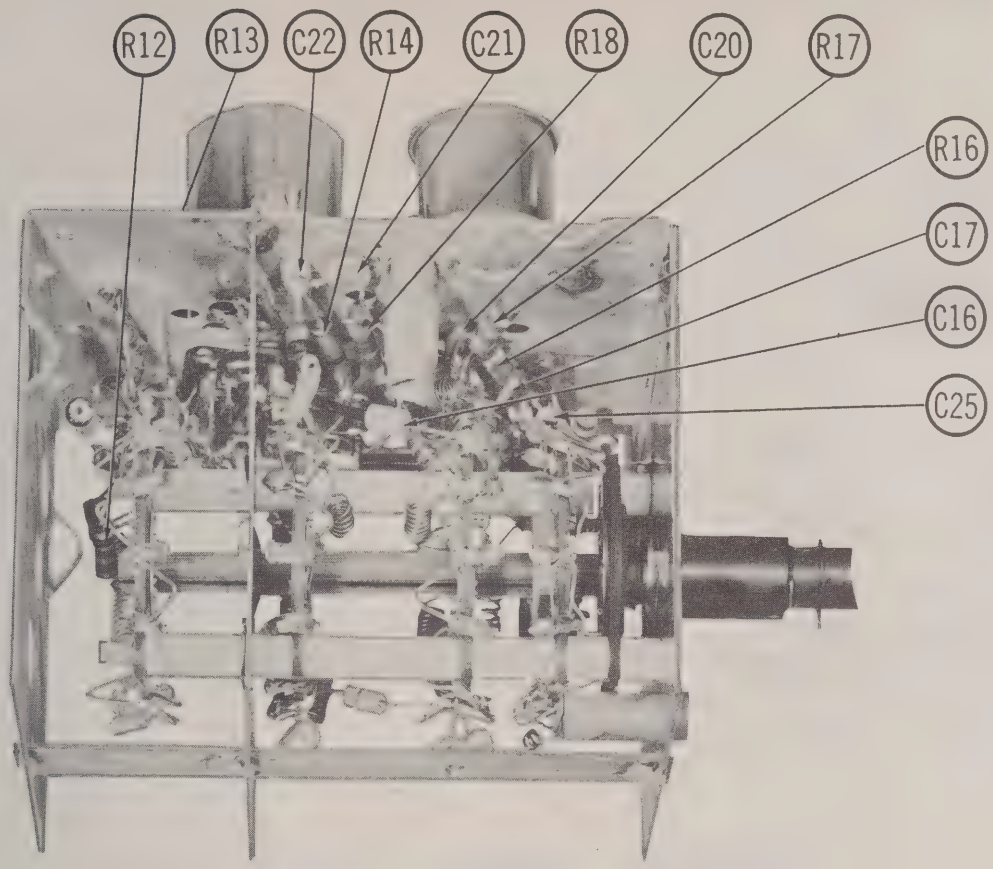
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

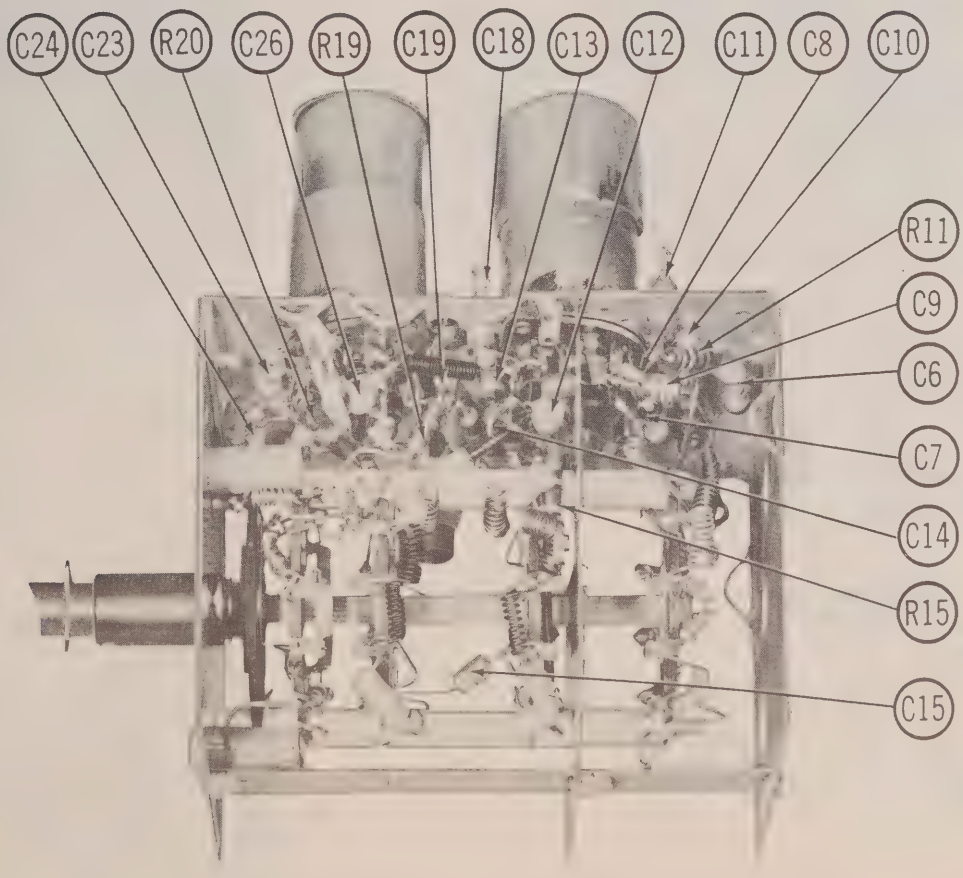
NAME	PART NO.	DESCRIPTION
Safety Glass	55089	
Mask	55088A	
Knob	52198A	Channel Selector
Knob	52199A	Fine Tuning
Knob	52200-1	On-off-volume
Knob	52200-2	Brightness
Knob	52200-3	Vert. Hold
Knob	52200-4	Contrast
Knob	52183	AGC

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

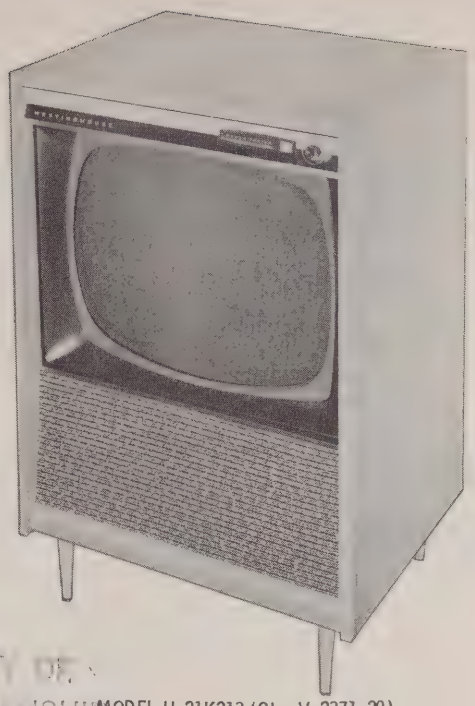
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove the push-on type control knobs from the front.
2. Remove 6 wood screws holding the rear cover. Remove the rear cover.
3. Remove from inside the cabinet at the front 2 wood screws (one on each side) holding the top of the front escutcheon.
4. Remove 4 wood screws along the bottom of the escutcheon. Remove the escutcheon.
5. Remove the 3 push-on type knobs accessible after escutcheon removal.
6. Remove speaker leads.
7. Remove 6 chassis bolts from the bottom.
8. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.



MODEL H-21K213 (Ch. V-2371-29)

DENVER, COLORADO

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-21K204A, H-21K205A, H-21T201A, H-21T202A	V-2371
		H-21K204B, H-21K205B, H-21T201B, H-21T202B	V-2371-22
		H-21K204, H-21K205, H-21T201, H-21T202	V-2371-24
		H-21K212, H-21K213, H-21K214, H-21K215, H-21K216	V-2371-29
		H-21KU212, H-21KU213, H-21KU214, H-21KU215, H-21KU216	V-2381-202
		H-21KU204, H-21KU205, H-21TU201, H-21TU202	V-2381-203
		H-21KU212A, H-21KU213A, H-21KU214A, H-21KU215A, H-21KU216A	V-2381-204
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N.J.		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 120 Watts, 1.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

On power tuning models the VHF oscillator may be adjusted by removing 6 wood screws holding the rear cover and remove the rear cover. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound. NOTE: (Other Models). For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

Remove the push-on type knobs from the front. Remove 4 screws along the bottom of the escutcheon. Remove the escutcheon, tilt safety glass out and lift up to remove.

FOCUS

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B2) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the quieting control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSE DEVICE

A 7.5Ω fusible resistor (R88) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

WESTINGHOUSE MODELS H-21K204, B, 205, B, H-21K212 Thru H-21K216, H-21KU204, 205, H-21KU212, A, Thru H-21KU216, A, H-21T201, B, 202, B, H-21TU201, 202 (Ch. V-2371-22, -24, -29, V-2381-202, -203, -204)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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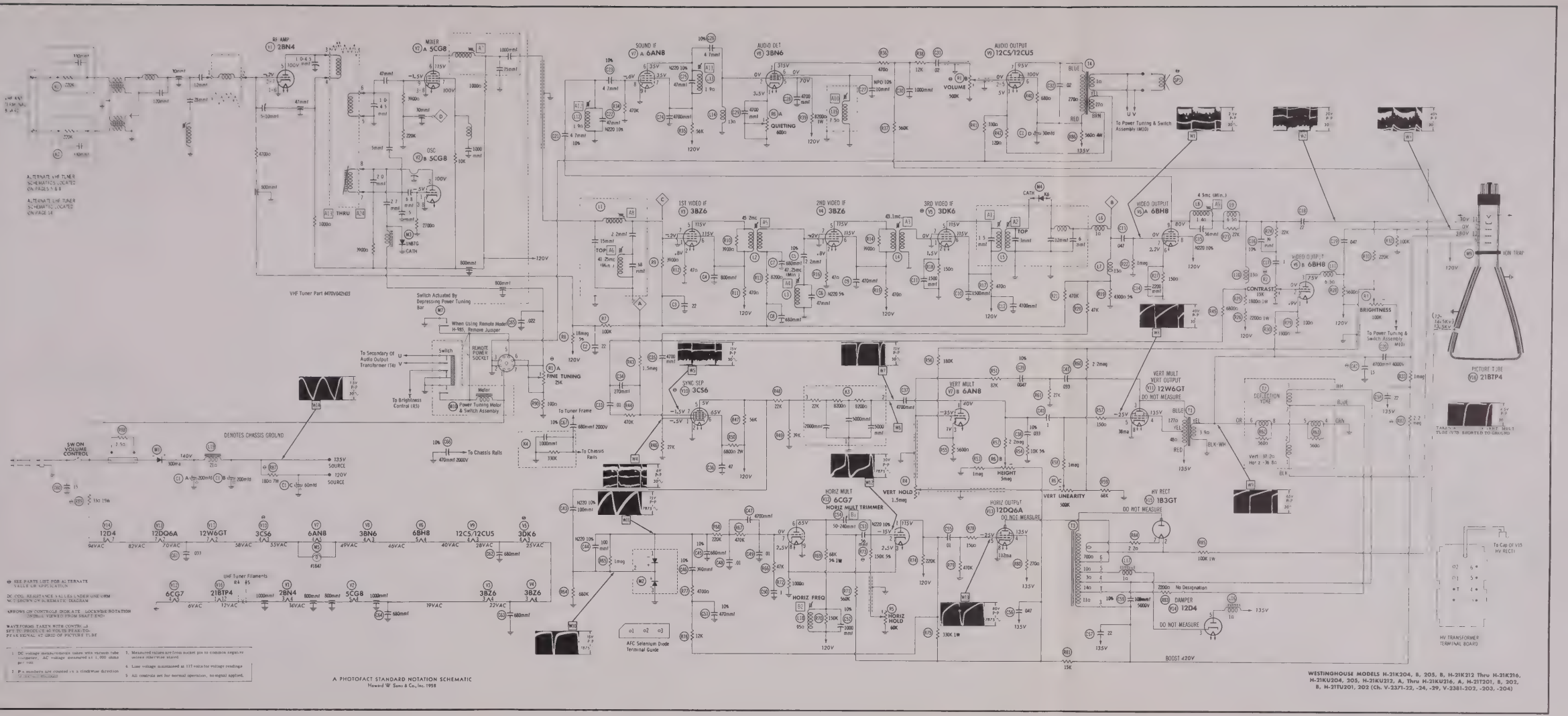
H320

FOLDER 4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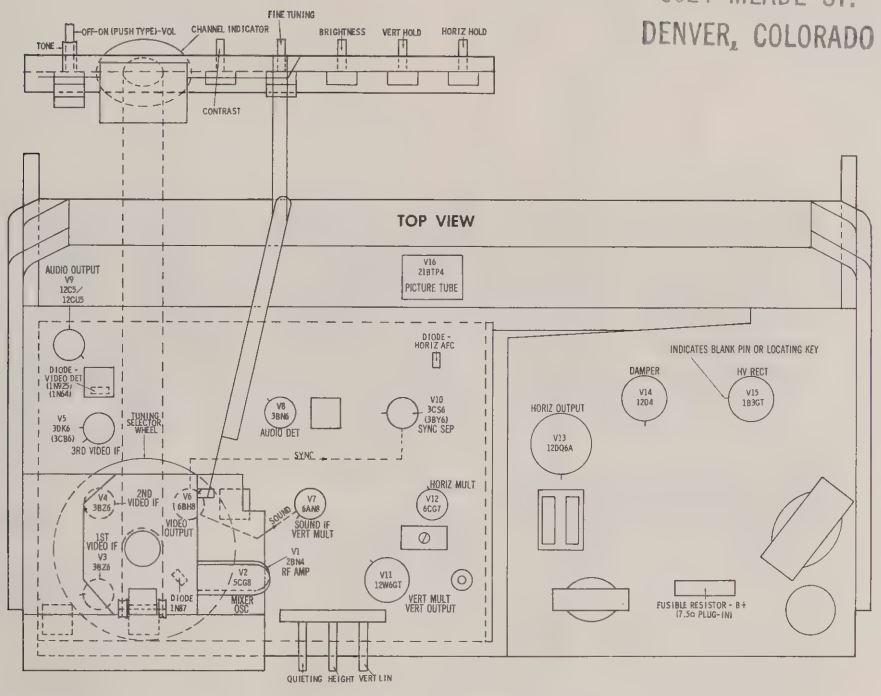
OSC V2B 5CG8
SOUND IF V7A 6AN8
AUDIO DET V8 3BN6
AUDIO OUTPUT V9 12C5/12CU5
VOLUME 500K
1ST VIDEO IF V3 3BZ6
2ND VIDEO IF V4 3BZ6
3RD VIDEO IF V5 3DK6
VIDEO OUTPUT V6A 6BH8
VIDEO OUTPUT V6B 6BH8
CONTRAST 15K
BRIGHTNESS 100K
PICTURE TUBE V16 21BTP4
ION TRAP
SYNC SEP V10 3CS6
VERT MULT V7B 6AN8
VERT MULT VERT OUTPUT V11 12W6GT DO NOT MEASURE
VERT HOLD 1.5meg
VERT LINEARITY 500K
HEIGHT 5meg
HORIZ MULT V12 6CG7
HORIZ MULT TRIMMER
HORIZ FREQ
HORIZ HOLD 60K
HORIZ OUTPUT V13 12DQ6A DO NOT MEASURE
HV RECT V15 1B3GT DO NOT MEASURE
DAMPER V14 12D4 DO NOT MEASURE
FINE TUNING 25K
REMOTE POWER SOCKET
Switch Actuated By Depressing Power Tuning Bar
When Using Remote Model H-985, Remove Jumper
To Secondary Of Audio Output Transformer (T4)
To Brightness Control (R5)
Power Tuning Motor & Switch Assembly
To Tuner Frame
To Chassis Rails
To Power Tuning & Switch Assembly (M10)
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
135V SOURCE
120V SOURCE
VHF Tuner Part 647DV042H03
ALTERNATE VHF TUNER SCHEMATICS LOCATED ON PAGES 5 & 8
ALTERNATE UHF TUNER SCHEMATIC LOCATED ON PAGE 14
UHF Tuner Filaments
12D4 94VAC
12DQ6A 82VAC
12W6GT 70VAC
3CS6 58VAC
6AN8 35VAC
3BN6 49VAC
6BH8 46VAC
12C5/12CU5 40VAC
3DK6 28VAC
6CG7 6VAC
21BTP4 12VAC
2BN4 14VAC
5CG8 19VAC
3BZ6 22VAC
AFC Selenium Diode Terminal Guide
HV TRANSFORMER TERMINAL BOARD
To Cap Of V15 HV RECT
BOOST 420V
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER NAME OF TUBE SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK-TO-PEAK SIGNAL AT GRID OF PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. P-A numbers are counted in a clockwise direction as shown.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

WESTINGHOUSE MODELS H-21K204, B, 205, B, H-21K212 Thru H-31K216, H-21KU204, 205, H-21KU212, A, Thru H-21KU216, A, H-21T201, B, 202, B, H-21TU201, 202 (Ch. V-2371-22, -24, -29, V-2381-202, -203, -204)

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

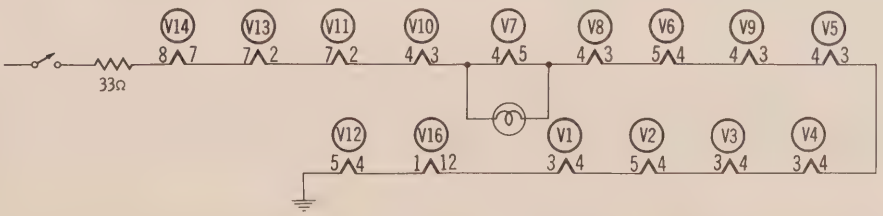
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R88), Rectifier (M1)**

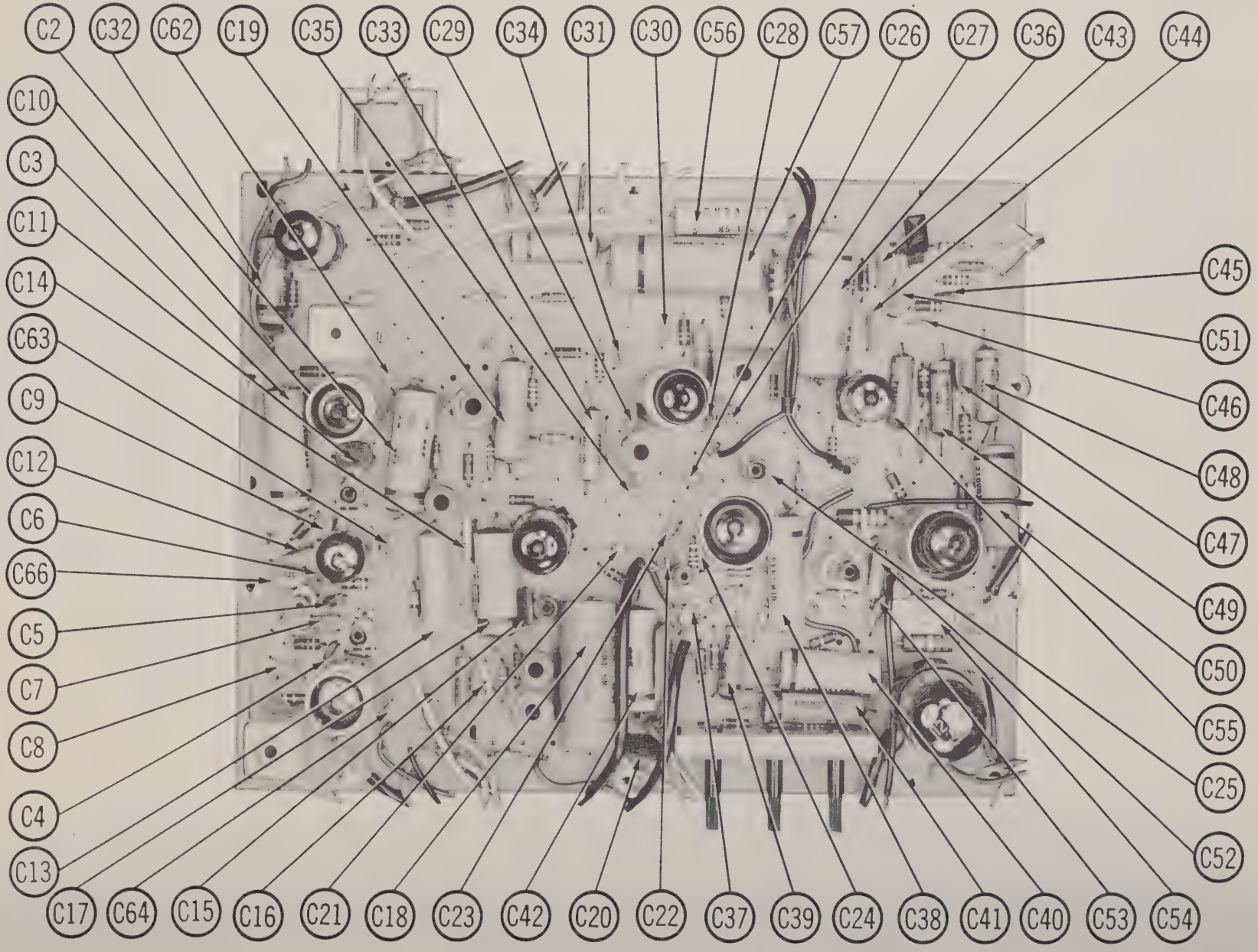
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, Diode (M4), V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V16**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10**
No horiz. sync - **V10, Rectifier (M2)**
No vert. or horiz. sync - **V10**

SWEEP FAILURE
No raster, has sound - **M2, V12, V13, V14, V15, V16**
No vertical deflection - **V7, V11**
Poor vert. linearity or foldover - **V7, V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, M1**
Vert. off freq. - **V7, V11**
Horiz. off freq. - **V12**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CAPACITOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALTERNATE TUNER SCHEMATIC

WESTINGHOUSE MODELS H-21K204, B, 205, B, H-21K212 Thru H-21K216, H-21KU204, 205, H-21KU212, A, Thru H-21KU216, A, H-21T201, B, 202, B, H-21TU201, 202 (Ch. V-2371-22, -24, -29. V-2381-202, -203, -204)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.

VIDEO IF ALIGNMENT

Connect the negative lead of 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3DK6 (V5). Low side to chassis.	45.0MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A1, A2	Adjust A1 for maximum gain at 43.9MC. Adjust A2 to rock the curve about the marker.
2.	"	High side to point Ⓒ. Low side to chassis.	Not used	43.1MC (Unmod)	"	USE VTVM. DC probe thru 47K to point Ⓑ. Common to chassis.	A3	Adjust for maximum deflection. Use only enough signal input to provide -1.5 volts on VTVM at maximum.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection. Use only enough signal input to provide -1.5 volts on VTVM at maximum.
5.	"	"	45.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 45.0MC 45.75MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A3, A5	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
6.	"	High side to point Ⓓ. Low side to chassis.	Not used	41.25MC (Unmod)	"	USE VTVM. DC probe thru 47K to point Ⓑ. Low side to chassis.	A6	Adjust for MINIMUM deflection.
7.	Fig. 2	Across antenna terminals thru matching network (Fig. 2).	"	215.75MC	13	"	Fine tuning	Adjust fine tuning for MINIMUM deflection.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A7, A8	Adjust A7 to the position which will rock the overall response curve about the 213.0MC marker when A8 is turned back and forth. Adjust A8 for symmetrical response similar to Fig. 3.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune the receiver to a TV station and connect an attenuator between the antenna and receiver terminals so that the signal strength may be varied from weak to strong.
Set the quieting control (R6A) to the center of its range.
Apply a strong signal to the receiver and adjust A10 for maximum volume. If peaks occur at two different positions that are widely separated, use the one with the slug farthest counter clockwise. If two peaks occur within a narrow range of adjustments, sufficient signal is not being applied to the receiver or the quieting control is not set at the desired position.
Reduce the signal strength until a hiss is heard in the sound. Adjust A11 and A12 for maximum volume. If two peaks occur on either slug, use the peak with the slug most counter clockwise.
Increase the signal strength and adjust the quieting control (R6A) for MINIMUM buzz of hum.

VHF OSCILLATOR ALIGNMENT FOR TUNER #470V042H03

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A14	
			201MC	199.25MC 203.75MC	11		A15	
			195MC	193.25MC 197.75MC	10		A16	
			189MC	187.25MC 191.75MC	9		A17	
			183MC	181.25MC 185.75MC	8		A18	
			177MC	175.25MC 179.75MC	7		A19	
			85MC	83.25MC 87.75MC	6		A20	
			79MC	77.25MC 81.75MC	5		A21	
			69MC	67.25MC 71.75MC	4		A22	
			63MC	61.25MC 65.75MC	3		A23	
			57MC	55.25MC 59.75MC	2		A24	

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNER #470V030H01

Switch the channel selector to the highest high band channel (7-13) operating in the area.
Set the fine tuning to the center of its range. The flat of the fine tuning shaft should be in the vertical plane.
Adjust the high band oscillator slug (A25) for best picture detail.
Switch channel selector to channel 6 if operating in the area and adjust A26 for best picture detail.
Switch to channel 4 if operating in the area and adjust A27 for best picture detail.
Switch to channel 2 if operating in the area and adjust A28 for best picture detail.
Check all channels operating in the area and repeat above if necessary.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

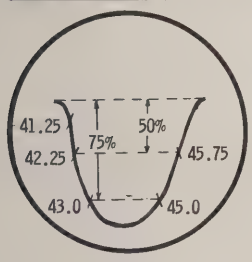
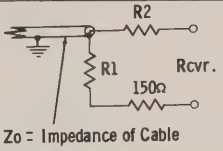


FIG.1



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 2

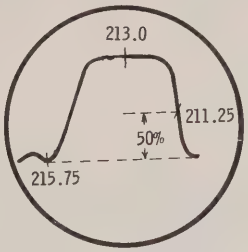


FIG. 3

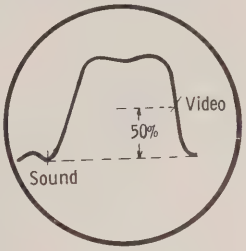


FIG.4

PROPERTY OF
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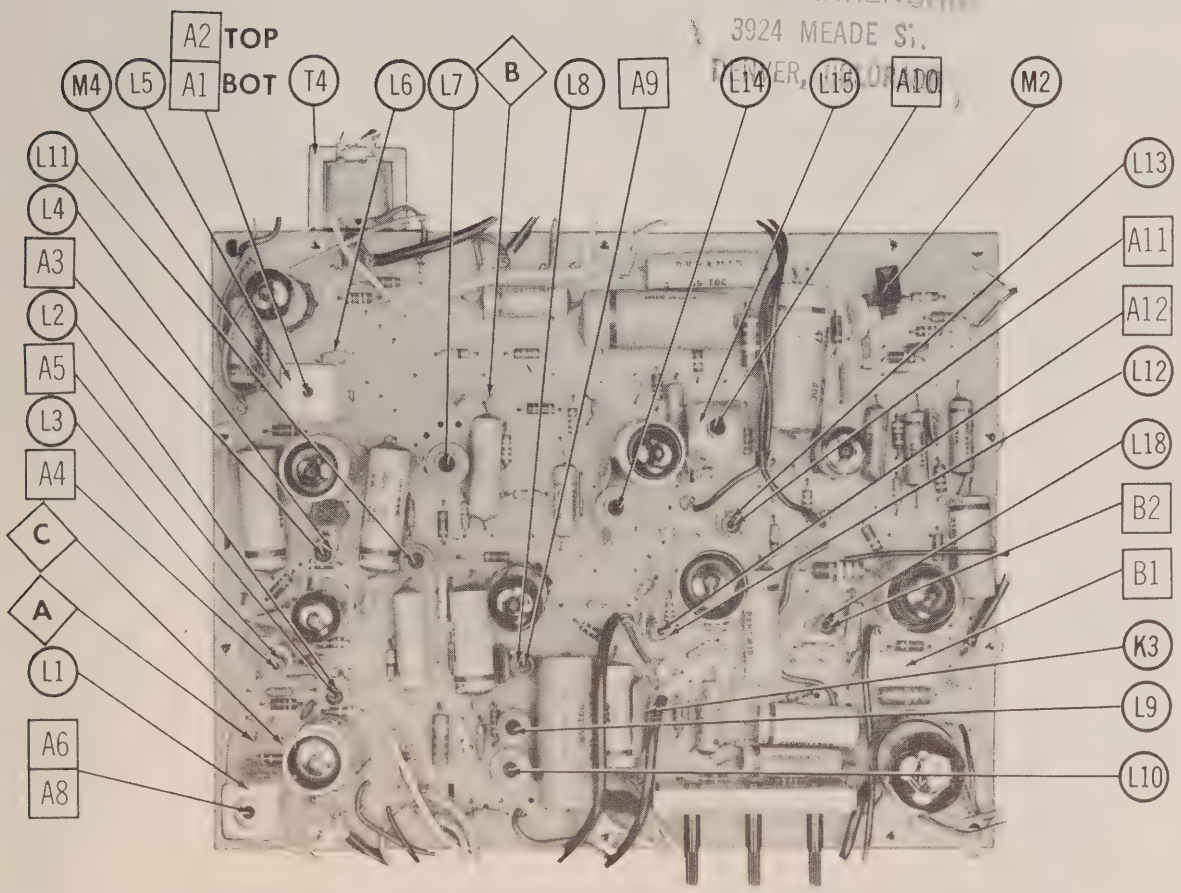
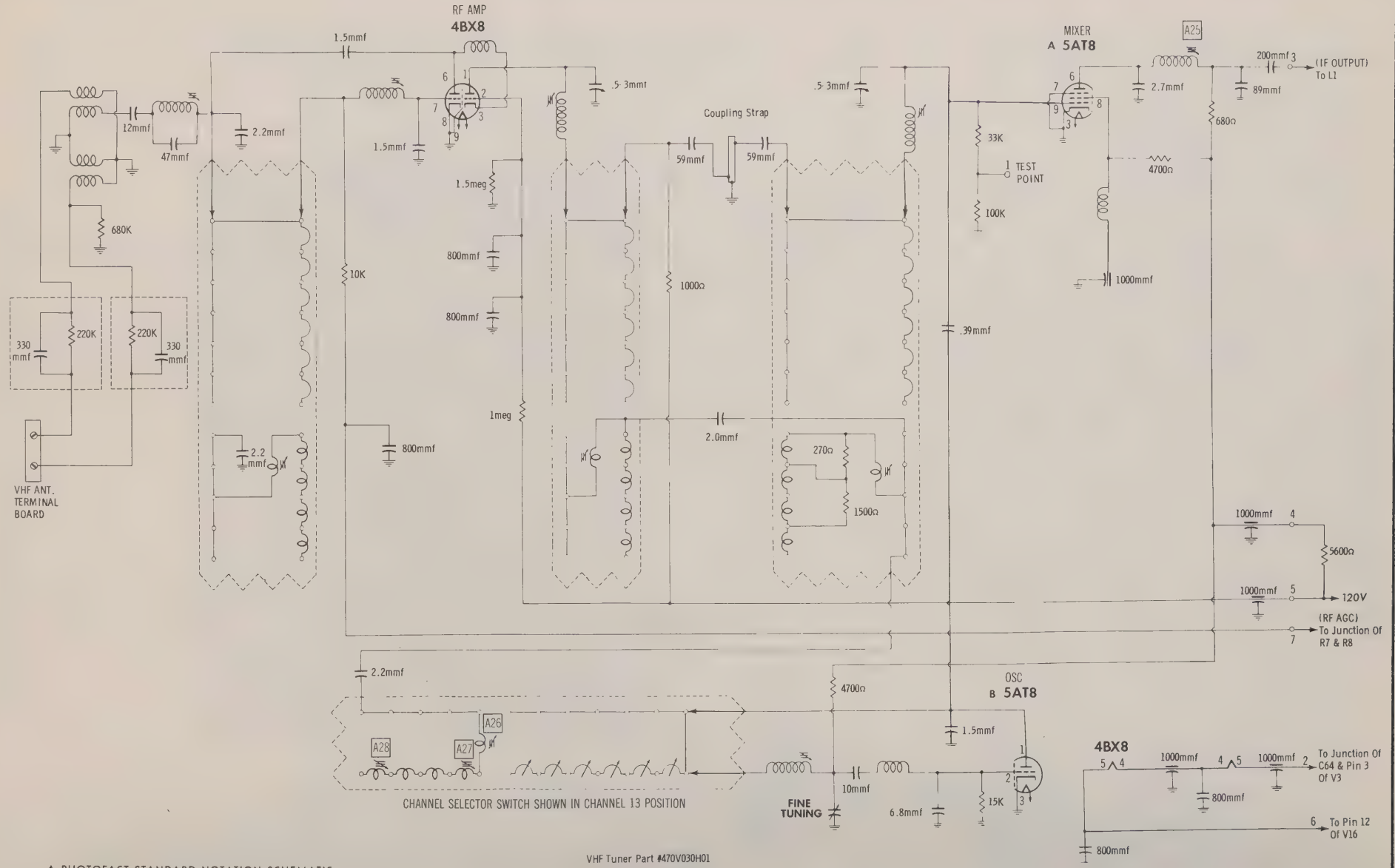
DENVER, COLORADO



INDUCTOR & ALIGN. IDENTIFICATION



VHF Tuner Part #470V030H01

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

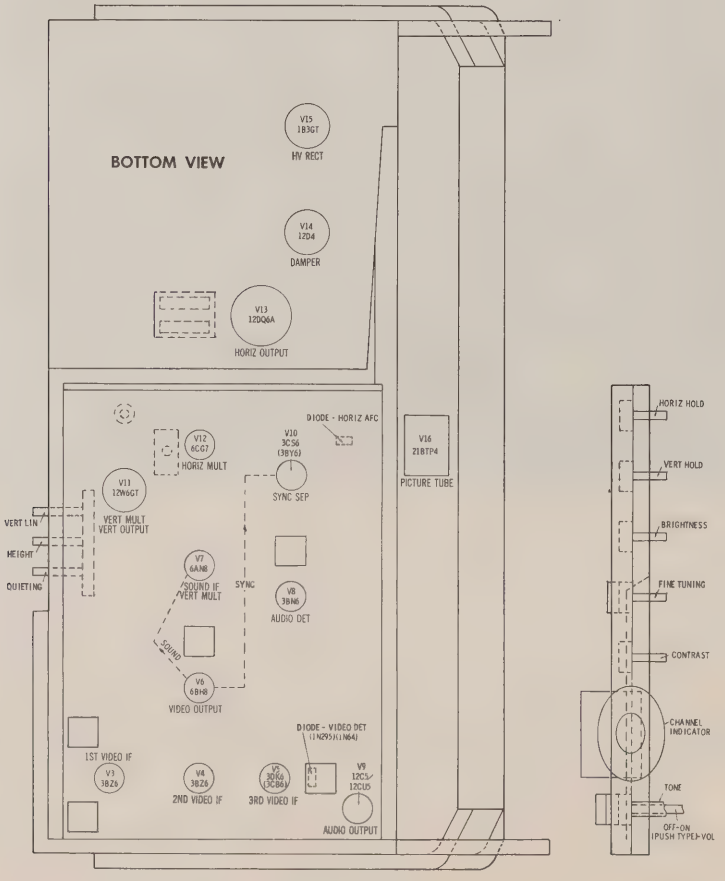
ALTERNATE TUNER SCHEMATIC

RESISTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	580K	3Ω	3.5Ω	† 1200Ω	0Ω	580K		
V2	5CG8	2700Ω	† 4100Ω	0Ω	4.5Ω	3.5Ω	† 1200Ω	† 10K	0Ω	220K
V3	3BZ6	480K	47Ω	4.5Ω	5Ω	† 650Ω	† 650Ω	0Ω		
V4	3BZ6	480K	47Ω	5Ω	5.5Ω	† 650Ω	† 650Ω	0Ω		
V5	3DK6	.1Ω	150Ω	5.5Ω	6Ω	† 650Ω	† 650Ω	0Ω		
V6	6BH8	100Ω	• 1500Ω	† 5800Ω	8Ω	9.5Ω	150Ω	1meg	† 180Ω	† 4200Ω
V7	6AN8	• ‡2.5meg	• 1.1meg	5600Ω	11Ω	10Ω	† 56K	† 56K	470K	0Ω
V8	3BN6	• 380Ω	13Ω	9.5Ω	10Ω	† 8400Ω	7.5Ω	‡560K		
V9	12C5/ 12CU5	330Ω	0Ω	6Ω	8Ω	0Ω	† 1200Ω	† 830Ω		
V10	3CS6	27K	0Ω	11Ω	12Ω	† 25K	† 6800Ω	2meg		
V11	12W6GT	NC	12Ω	† 175Ω	† 48Ω	• 1.1meg	NC	14Ω	0Ω	
V12	6CG7	‡345K	•160K	1000Ω	0Ω	1.5Ω	† 68K	1.5meg	1000Ω	0Ω
V13	12DQ6A	NC	14Ω	NC	† 270Ω	470K	NC	16Ω	0Ω	TOP CAP ‡11Ω
V14	12D4	NC	NC	¶	NC	† 1Ω	NC	16Ω	18Ω	
V15	1B3GT	PINS		1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡711Ω
V16	21BTP4	1.5Ω	100K	PIN 6 † 180Ω	PIN 10 ‡3.2meg	PIN 11 • 240K	PIN 12 3Ω			

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 135V SOURCE.
‡ MEASURED FROM PIN 3 OF V14.
NC NO CONNECTION.



TUBE PLACEMENT CHART

...NGHIP
...4 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

WESTINGHOUSE MODELS H-21K204, B, 205, B, H-21K212 Thru H-21K216, H-21KU204, 205, H-21KU212, A, Thru H-21KU216, A, H-21T201, B, 202, B, H-21TU201, 202 (Ch. V-2371-22, -24, -29, V-2381-202, -203, -204)

FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer-Oscillator	3A8	
V3	1st Video IF Amp	3B26	
V4	2nd Video IF Amp	3B26	
V5	3rd Video IF Amp	3DA8	Note 1
V6	Video Output	6BH6	
V7	Sound IF Amp -Det - Mult	6AN8	
V8	Audio Det	3BN6	

ITEM No	USE	TYPE	NOTES
V9	Audio Output	12C5	
		12A5	
V10	Sync Sep	3C86	Note 2
V11	Vert Mult -Vert Output	12W6GT	
V12	Horiz Mult	6CG7	
V13	Horiz Output	12AQ8A	
V14	Damper	12D4	
V15	HV Rectifier	1B3GT	

Note 1. Some versions may use a 3CB6 in this application.
Note 2. Some versions may use a 3BY6 in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA			NOTES
	Westinghouse PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No.	
V16	21BTP4	21BTP4	21BTP4 ②	① Aluminized ② Silver screen 85

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Westinghouse PART No.	AEROVOX PART No	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1A	200	175	21SV018M01	AF188-4-55		FP147. 8			R3545 *
B	200	175				LTC49			
C	200	175							
D	33	175							

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd for Mica and Ceramic Capacitors

ITEM No	RATING		REPLACEMENT DATA								NOTES
	CAP	VOLT	Westinghouse PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No.	ERIE PART No	MALLORY PART No	SPRAGUE PART No		
C3	22	200	21OV002A34	P288N-22		CUB2P22		GEM-2022	2TM-P22		
C3	22	200	21OV002A34	P288N-22		CUB2P22		GEM-2022	2TM-P22		
C4	6		21SV300R18	BPD-0008	DD-8R1	L107S	ED-0008		5GA-T8		
C5	2.2		21TV012A39	NPO-S1 2.2	TCZ-2R2	C10V22C	TCO-2.2		STCCD-V22	10%	
C6	47		21SV300R56								N220 5%
C7	680		21SV16A81	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C8	680		21SV16A81	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C9	470		21SV300H07	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47		
C10	1500		21SV300I38	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15		
C11	1500		21SV300I38	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	5HK-D15		
C12	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C13	047	400	21SV016A47	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47		
C14	3200		21TV012A40	SI 3200		L76D32	GP-3200	UC-5322	GA-D32		
C15	56		21SV15A56								N220 10%
C16	39		21SV013A30	NPO-S1 39	DD-390	L10G39	ED-39		MS-439		10%
C17	.	400	21SV004A04	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C18	22	600	21SV002A24	P688N-22		CUB6P22		GEM-6022	6TM-P22		
C19	047	400	21SV004A33	P488N-0474	DF-503	CUB4S47		GEM-4147	4TM-S47		
C20	4700	4000	21SV300I10								
C21	4.7		21TV004A79	NPO-S1 4.7	TCZ-4R7	CTA6V4TC	TCO-4.7	ZT-5547	STCCD-V47	10%	
C22	47		21SV04A70								N220 10%
C23	4.7		21TV004A79	NPO-S1 4.7	TCZ-4R7	CTA6V4TC	TCO-4.7	ZT-5547	STCCD-V47	10%	
C24	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C25	47		21SV04A70								N220 10%
C26	4.7		21TV004A79	NPO-S1 4.7	TCZ-4R7	CTA6V4TC	TCO-4.7	ZT-5547	STCCD-V47	10%	
C27	10		21SV300E36	NPO-S1 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	STCC-G1		NPO 10%
C28	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C29	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C30	1000			BPD-001	DD-103	BYA8D1	ED-1000	DC5B	5HK-D1		
C31	.02	600	21SV002A23	P688N-02	DD-203	CUB6S2	ED-02	GEM-612	6TM-S2		
C32	02	600	21SV002A23	P688N-02	DD-203	CUB6S2	ED-02	GEM-612	6TM-S2		
C33	.01	400	21SV15A33	P488N-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1		
C34	470		21SV300H26	BPD-00047	DD-271	L10T27	ED-270	UC-5327	5GA-T27		
C35	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C36	47	400	21SV016A74	P488N-47				GEM-4047	4TM-P47		
C37	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C38	033	600									10%
C39	0047	600	21OV110E05					GEM-16247			10%
C40	1	400	21OV01A04	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C41	033	600	21OV06SA33	P688N-033	DF-303	CUB6S33		GEM-6133	6TM-S33		
C42	15	300		P388N-15		CUB3P15		GEM-3015	3TM-P15		Note 1
C43	100		21SV01A01								N220 10%
C44	100		21SV01A01								N220 10%
C45	680		21SV300E33		DE-681	1RS768	ED-680		MS-368		10%
C46	390		21SV300E32		DE-391	L10T39	ED-390		MS-339		10%
C47	4700		21SV300H04	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5347	5HK-D47		
C48	01	400	21SV05IA03	P488N-01	DE-103	CUB4S1	GP-10000	GEM-411	4TM-S1		
C49	01	400	21SV05IA03	P488N-01	DE-103	CUB4S	GP-10000	GEM-411	4TM-S1		
C50	1	400	21OV01A04	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1		
C51	470		21SV04A71	4464-00047	DE-471	5RS747	ED-470		MS-347		10%
C52	047		21SV07A03	5464-001		UR5X	ED-1000	MCR265	MR-51		10%
C53	56		21SV15A50								N220 10%
C54	50-240		21TV05IA03								
C55	01	400	21OV05IA03	P488N-01	DE-103	CUB4S1	GP-10000	GEM-411	4TM-S1		
C56	047	600	21OV024A73	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47		
C57	22	400	21SV013A34	P488N-22		CUB4P22		GEM-4022	4TM-P22		
C58	22	600		P688N-22		CUB6P22		GEM-6022	6TM-P22		
C59	100	5000	21SV300H34								10%
C60	.15	400	21OV22A54	P488N-15		CUB4P15		GEM-4015	4TM-P15		
C61	033	600	21OV13A33	P688N-033	DF-303	CUB6S33		GEM-6133	6TM-S33		
C62	680		21SV16A81	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C63	680		21SV16A81	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C64	680		21SV16A81	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	5GA-T68		
C65	022	600	21SV002A23	P688N-022	DD-203	CUB6S22	ED-02	GEM-6122	6TM-S22		
C66	470	2000	21SV300M20								10%
C67	680	2000	21SV300M19								10%

Note 1 Some versions may use a 33mfd 5 600V (Part #21OV003A34) in this application

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	25K		27OV039H05				UE823S	Fine Tuning - Note 1
B	500K						Not Req.	Volume - Note 1
C	Switch						Not Req.	
R2A	15K		27OV032H04	B-30	A47-15K-B	BU-118	TA153L	Contrast - Note 2
B	Shaft			Not Req.	KSH-3	SKS	Not Req.	
R3A	500K		27OV032H02	B-40	A47-500K-S	QU-128	TA151.	Brightness
B	Shaft			Not Req.	KSH-3	Not Req.	Not Req.	
R4A	1 Meg		27OV032H05	B-742	A47-1.2meg -S	QU-138	TA155L	Vert Hold
B	Shaft			Not Req.	KSH-3	Not Req.	Not Req.	
R5A	60K		27OV032H01	B-25	A47-75K-S	QU-125		Horiz. Hold
B	Shaft			Not Req.	KSH-3	Not Req.		
R6A	800Ω		27OV018H05					Quieting
B	Sweep							Height
C	500K							Vert. Lin.

Note 1. An alternate single control of volume section only (Part #27OV033H01) is used in Chassis V-23T1-22, -24, V-23E-203.
Note 2. Alternate part #27OV032H07 is used in Chassis V-23T1-23, -24, V-23E-203.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R7	100K		25OV22A04	
R8	15meg 5%		25OV27A18	
R9	390Ω		25SV003H02	
R10	390Ω		25SV003H02	
R11	470Ω		25OV224A71	
R12	47Ω		25OV224A70	
R13	8200Ω		25SV003H28	
R14	8200Ω		25SV003H02	
R15	470Ω		25OV224A71	
R16	47Ω		25OV224A70	
R17	470Ω		25OV224A71	
R18	150Ω		25OV22A51	
R19	4300Ω 5%		25OV214A32	
R20	47K		25OV224A73	
R21	470K		25OV224A74	
R22	1meg		25OV22A05	
R23	22K		25OV223A33	
R24	22K		25OV223A33	
R25	1800Ω	1	25OV23A82	
R26	2200Ω	1	25OV23A22	
R27	150Ω		25OV22A51	
R28	5600Ω		25OV225A62	
R29	200Ω		25OV22A20	
R30	3200Ω		25OV223A32	
R31	220K		25OV223A24	
R32	100K		25OV22A04	
R33	1meg		25OV22A05	
R34	470K		25OV224A74	
R35	56K		25OV225A63	
R36	100Ω		25OV22A20	
R37	560K		25OV225A64	
R38	12K		25OV22A23	
R39	8200Ω	1	25SV003H28	
R40	680Ω		25OV226A81	
R41	330Ω		25OV22A31	
R42	120Ω		25OV225A21	
R43	1 Meg		25OV22A55	
R44	470K		25OV224A74	
R45	6800Ω		25OV226A82	
R46	27K		25OV223A73	
R47	56K		25OV225A63	
R48	22K		25OV223A33	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R49	39K		25OV223A93	
R50	6800Ω	2	25OV226A83	
R51	82K		25OV228A33	
R52	2.2meg		25OV232A35	
R53	1meg		25OV22A05	
R54	10K 5%		25OV21A03	
R55	56000Ω		25OV225A82	
R56	180K		25OV22A84	
R57	150Ω		25OV23A51	
R58	1meg		25OV22A05	
R59	68K		25OV228A83	
R60	2.2meg		25OV22A25	
R61	27K		25OV222A73	
R62	560Ω		25OV225A61	
R63	560Ω		25OV225A61	
R64	680K		25OV228A84	
R65	1meg		25OV22A05	
R66	47K		25OV224A73	
R67	470K		25OV224A74	
R68	220K		25OV223A24	
R69	68K 5%	1	25SV316A83	
R70	150K		25OV22A54	
R71	560K		25OV225A64	
R72	1000Ω		25OV22A02	
R73	150K 5%		25SV311A54	Note 1
R74	220K		25OV223A24	
R75	330K	1	25SV323A34	
R76	12K		25OV22A23	
R77	47000Ω		25OV224A72	
R78	33Ω		25OV21A31	
R79	470K		25OV224A74	
R80	270Ω		25OV22A75	
R81	15K		25OV22A53	
R82	2.2meg		25OV223A25	Note 2
R83	220Ω		25OV22A23	
R84	2.2Ω		25LV003A29	
R85	100K	1	25SV003H09	
R86	560Ω	4	25IV020H07	
R87	180Ω	7		Note 3
R88	7.5Ω		25SV002H01	
R89	33Ω	15	25LV01EH09	Note 4
R90	100Ω			

Note 1 Some versions may use a 220K (Part#25OV222A24) in this application.
Note 2 Not used in Chassis V-23T1-22, -24, V-23E-203
Note 3. Some versions use a 180Ω, 4W (Part #25OV020H05) in this application
Note 4. Chassis V 23E1 uses a 29Ω, 15W (Part #25LV07EH09) in this application

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Output	43OV033H03							
T2A	Yoke-Horiz. (21MIP)	49OV004H01							
B	(60°)-Vert. (25. 5MH)								
M3	Rear Cover & Centering Device	78LV083H01							
T3	Horiz. Output	48SV003H04							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	2500Ω	8-4Ω	43OV037H01						
	Turns Ratio								
	Pri. 2	Sec. 2							
	3.5	1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C. IMP.	Westinghouse PART No	QUAM PART No	
SP1	8"	PM	8-8Ω	57OV016H02 1	8A3IZ7.9	1 Used in Models H-21KB2, 2L3, H-21KU212A, 213A
	8"	PM		57OV009H02 2		2 Used in Models H-21KB4, 2I5, 2I6, H-21KU214A,
	5"	PM		57OV016H02 3		215A, 216A
	9"	PM		57OV017H01 4		3 Used in Models H-21T201A, B, H-21TU201, H-21T202A, B, H-21TU202
	6"	PM		57OV016H02 5		4 Used in Models H-21KB04A, B, H-21KU204, H-21KB06A, B, H-21KU206

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	1st. Video IF	23SV003B01					Includes 41. 25MC trap and capa.
L2	2nd. Video IF	23SV020H01					
L3	47. 25MC Trap	23OV030H01					
L4	3rd. Video IF	23SV020H01					
L5	4th Video IF	23SV005H01					Complete assembly
L6	RF Choke	23OV019I10	19-1006		4624		14 Microhenries
L7	Shunt Peaking Coil	23OV034H01		TV-190	6132	VP-7	350 Microhenries
L8	4. 5MC Trap	23SV030H02					
L9	Series Peaking Coil	23OV034H02	19-3100	TV-194	6112	VP-3	100 Microhenries
L10	Shunt Peaking Coil	23OV034H01		TV-190	6132	VP-7	350 Microhenries
L11	Series Peaking Coil	23OV034H03	19-3100	TV-194	6113	VP-3	100 Microhenries
L12	1st. Sound IF	23OV030H04					
L13	2nd. Sound IF	23OV030H04					
L14	RF Choke	23OV034H01		TV-190	6132	VP-7	350 Microhenries
L15	Quadrature Coil	23OV031H01					
L16	RF Choke	23OV019I10	19-1006		4624		14 Microhenries
L17	RF Choke	23OV019H10	19-1008		6624		14 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Meissner PART No	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	
L18	96Ω		23OV032H01						

FILTER CHOKE

ITEM No	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0. CURRENT 1000 Ma)	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No
L19	310A	21Ω	4 Hy	43OV032H02	C5037 1	C-2096 1	C-2326 1	28C44 1	C-27X

① Drill new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
K1	Antenna Isolation	330mmf, 220K	21SV004H02	Centralab Sprague	RC431 R-9179
K2	Antenna Isolation	330mmf, 220K	21SV004H02	Centralab Sprague	RC431 R-9179
K3	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 8200Ω, 8200Ω	21SV003H01	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-501 PC-104 115TMI 1406-01 103C13
K4	Chassis Isolation	1000mmf, 330K	21SV004H03	Sprague	R-9180

RECTIFIERS

ITEM No	RATING		REPLACEMENT DATA				NOTES
	CURRENT (Mean.rect)	Westinghouse PART No	FEDERAL PART No	GENERAL ELECTRIC PART No	INTERNATIONAL PART No	SARKES TARZIAN PART No	
M1	.300A	29SV006H01 1	1238A 3	1N1007 3	3FSI 1 MR350 2 1TI ③④	M500 1 350 2	1 Silicon Type. 2 Selenium Type. 3 Germanium Type. ④ 2 required.
M2		29SV004H01 ②	12S ③④				

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Westinghouse PART No	CBS PART No.	SYLVANIA PART No.	
M3	1N87G	29SV002H02	1N60	1N60	Fine Tuning (Pigtail)
M4	K8		1N50	1N34A	Video Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M5	Pilot Lamp	756V501B03	#1847
M6	Tuner	47OV043H03	VHF - Ch. V-23T1-23
	Tuner	47OV03IH01	VHF - Ch. V-23T1-22
	Tuner	47OV029H01	VHF - Ch. V-23T1-24
	Tuner	47OV021H03	VHF - Ch. V-23E1-203
	Tuner	472V024H01	UHF - Ch. V-23E1-202,-203
	Tuner	472V024H03	UHF
	Tuner	47OV024H01	VHF - Ch V-23E1-203
	Tuner	47OV020H03	VHF - Ch. V-23E1-204
	Tuner	472V020H01	UHF - Ch. V-23E1-204
M7	Switch	78SV013H01	Channel Selector (Leaf Type)
M8	Centering Device	78LV083H01	Includes yoke cover
M9	Ion Trap	78TV501A04	
M10	Motor	78TV052H01	Drive Assembly (Includes switch)

WESTINGHOUSE MODELS H-21K204, B, 205, B, H-21K212 Thru H-21K216, H-21KU204, 205, H-21KU212, A, Thru H-21KU216, A, H-21T201, B, 202, B, H-21TU201, 202 (Ch. V-23T1-22, -24, -29, V-23E1-203, -203, -204)

FOLDER 4

PARTS LIST AND DESCRIPTIONS (Continued)

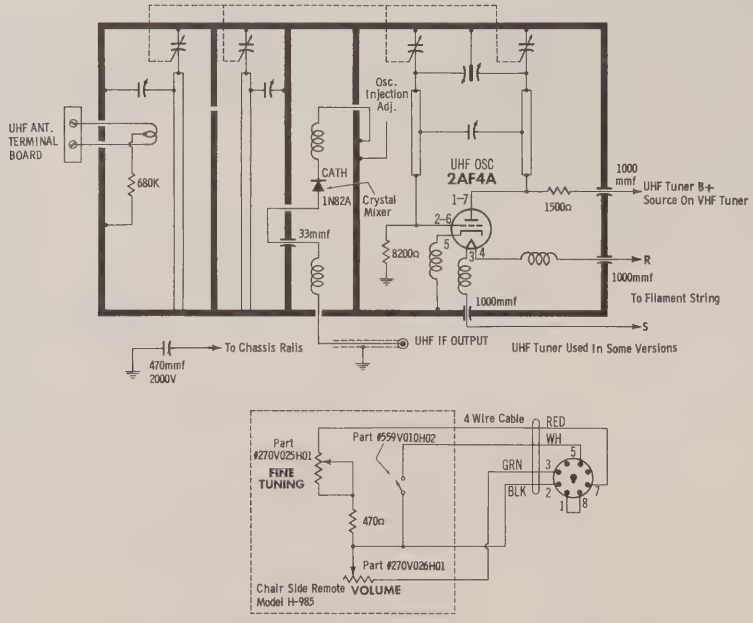
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	630V008H01	
Mask	610V007H02	
Escutcheon	555V013H02	Control Panel
Escutcheon	555V013H01	Control Panel - Models H-21T201B, H-21TU201, H-21T202B, H-21TU202, H-21K204B, H-21KU204, H-21KU205, H-21K205B
Knob	550V045H02	On-off-volume
Knob	550V044H01	Horizontal, vertical, brightness, contrast
Knob	550V047H01	VHF Fine Tuning
Knob	550V050H01	UHF Channel Selector
Knob	550V046H01	Channel Selector (VHF) Models H-21TU201, 202, H-21KU204, 205, H-21T201A, 202A, H-21K204A, 205A
Knob	550V046H02	Channel Selector (VHF) Models H-21T201B, 202B, H-21K204B, 205B
Knob	550V051H02	Contrast, fine tuning, on-off-volume - Models H-21T201B, H-21TU201, H-21T202B, H-21TU202, H-21K204B, H-21KU204, H-21K205B, H-21KU205, H-21T201A, 202A , H-21K204A, 205A
Dial	550V029H04	UHF
Cabinet	516V038H02	Model H-21K213
Cabinet	516V038H01	Model H-21K212
Cabinet	516V038H03	Model H-21KU212
Cabinet	516V038H04	Model H-21KU213
Cabinet	510V011H05	Model H-21T201A, B
Cabinet	510V011H06	Model H-21T201
Cabinet	510V011H07	Model H-21T202A, B
Cabinet	510V011H08	Model H-21TU202
Cabinet	510V012H03	Model H-21K204A, B
Cabinet	510V012H04	Model H-21KU204
Cabinet	510V012H05	Model H-21K205A, B
Cabinet	510V012H06	Model H-21KU205
Cabinet	516V044H01	Model H-21K214
Cabinet	516V044H04	Model H-21KU214
Cabinet	516V044H02	Model H-21K215
Cabinet	516V044H05	Model H-21KU215
Cabinet	516V044H03	Model H-21K216
Cabinet	516V044H06	Model H-21KU216
Leg	558V019H11	Models H-21K212, H-21KU212
Leg	558V019H12	Models H-21K213, H-21KU213
Leg	558V019H05	Model H-21K204B
Leg	558V019H06	Model H-21K205B
Leg	690V012H01	Model H-21K214
Leg	690V012H02	Model H-21K215
Leg	690V012H03	Model H-21K216
Leg	518V001H09	Model H-21K204A
Leg	518V001H10	Model H-21K205A

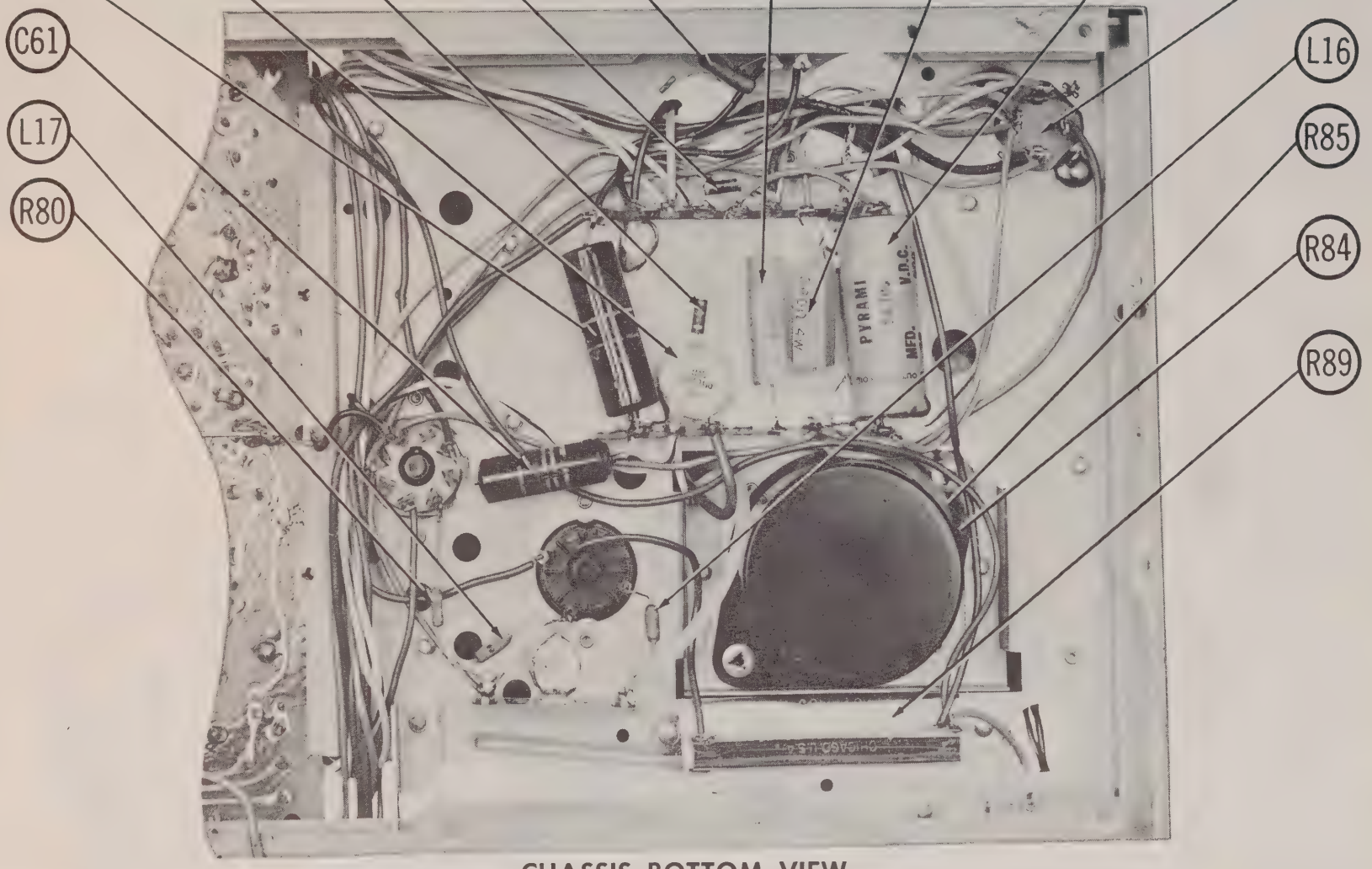
WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor

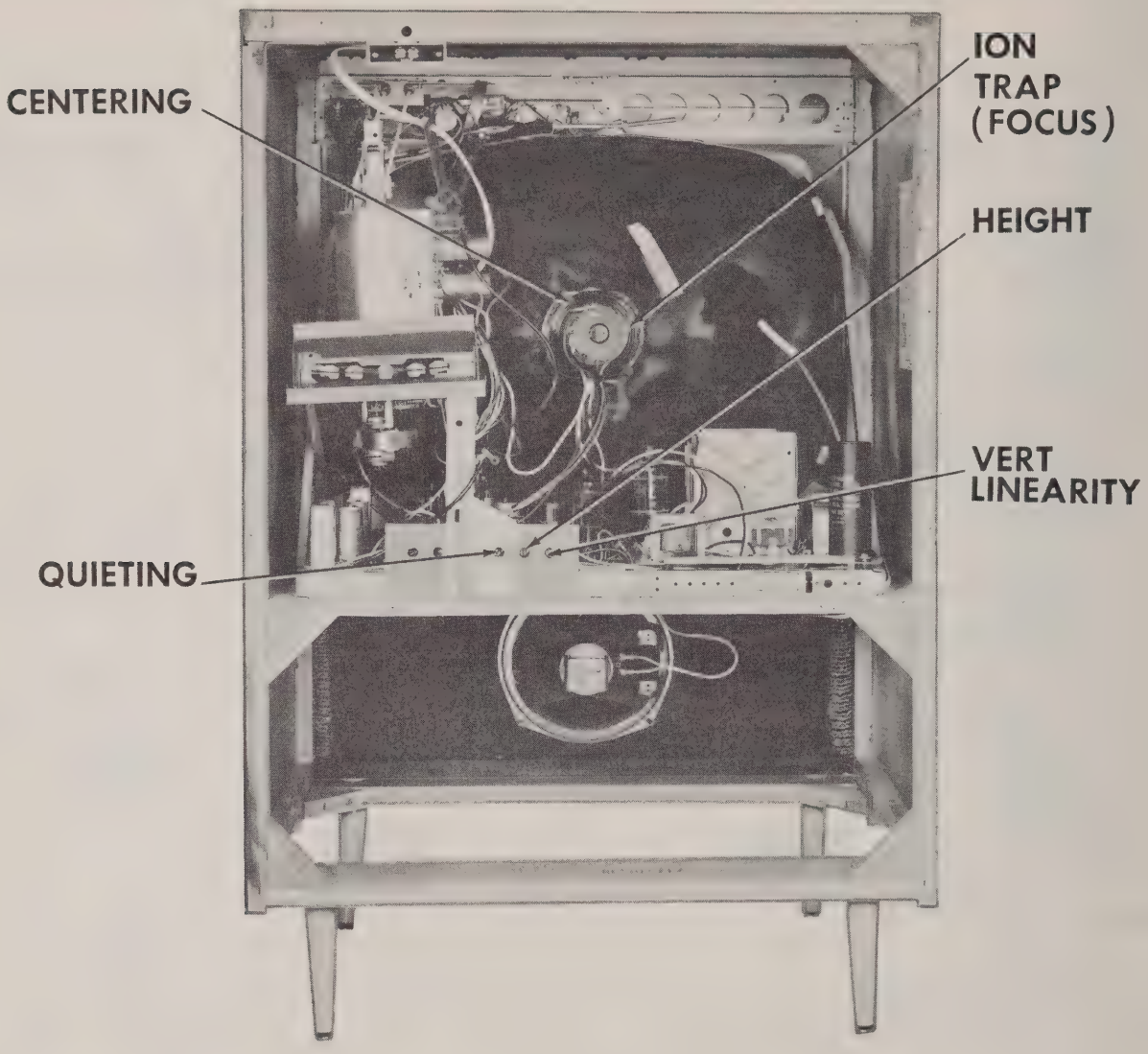


A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE TUNER SCHEMATIC



CHASSIS BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station preferably with a test pattern.

1. Connect a clip lead across the horizontal frequency coil (L18).

2. Set the horizontal hold control to the center of its range and leave it in this position during the steps that follow.

3. Connect the DC probe of the VTVM to pin 7 (grid) of the 6CG7 (V12). Common to chassis.

4. Adjust horizontal mult. trimmer (B1) for zero voltage on the meter. If zero voltage can be approached but not quite reached at one extreme of the B1 adjustment, it may be necessary to set the horizontal hold control SLIGHTLY to one side of mid-position to obtain zero voltage.

5. Remove the clip lead from L18.

6. Adjust the horizontal frequency slug (B2) for zero voltage on the meter, and check the adjustment by switching to another channel and back again. The picture should pull into sync on all channels.

PHOTOFACT* Folder
*TRADE MARK

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 360

MAGNAVOX CHASSIS U19-01BB, U19-02BB, V19-01BB, V19-02BB

Magnavox Chassis V19-01AA, V19-02AA, U19-01AA and U19-02AA were covered in Photofact Folder 6 — Set 360.

Chassis V19-01BB, V19-02BB, U19-01BB and U19-02BB are electrically identical to the chassis covered, except for the following changes.

COMPONENT CHANGES

A 3.3 microhenry choke (Part #360601-6) is added between pins 2 and 5 of the deflection yoke plug.

R64 is decreased from 100K to 82K.

R70 is decreased from 560Ω to 470Ω.

A 10K ½ watt resistor is added from pin 7 of V14 (HV Rectifier) and the high voltage anode lead to the picture tube.

R50 is increased from 1meg to 1.2meg.

A 1500mmf @ 500V ceramic disc capacitor is added in parallel with R69.

A 680mmf @ 500V ceramic disc capacitor is added from pin 5 of V6 (sound IF) to ground.

C64 is increased from 120mmf to 160mmf.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 362

STEELMAN MODEL 3A16-1

Steelman Models 3A15, 3A16 and 3A17 were covered in Photofact Folder 11 — Set 362.

Model 3A16-1 is electrically identical to the models covered, except for the following changes.

COMPONENT CHANGES

C4A is decreased from 1500mmf to 1000mmf.

C4C is decreased from 200mmf to 150mmf.

C4D is decreased from 7000mmf to 5000mmf.

R15 is decreased from 130Ω, 10 watt to 125Ω,5 watt .

NEW ELECTROSTATIC SPEAKER ADDED

An electrostatic speaker and network has been added. A partial schematic showing the new circuit is given on the reverse side.

NEW RECORD CHANGER

For service information on the record changer see similar V-M Model 1200A - Photofact Set 353 - Folder 16.

(Continued on Reverse Side)

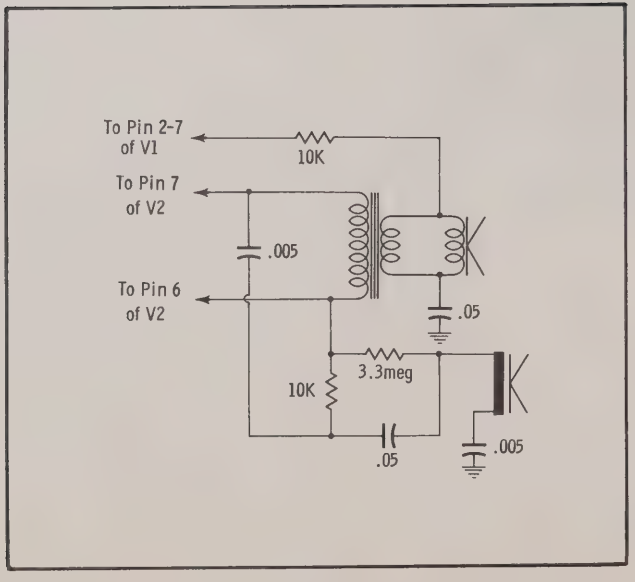
PRODUCTION CHANGES
BULLETIN 200

PRODUCTION CHANGES
BULLETIN 200

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana . Printed in U.S. of America

FOLDER 5


To Pin 2-7
of V1
10K
To Pin 7
of V2
.005
To Pin 6
of V2
.05
3.3meg
10K
.05
.005

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 356

SENTINEL CHASSIS CR-729CA

Sentinel Chassis CR-729AA and CR-729BA were covered in Photofact Folder 10 — Set 356.

Chassis CR-729CA is electrically identical to the chassis covered, except for the following changes.

CORRECTION NOTICE

The part number for R1 (volume control) was listed erroneously. The correct part number is 220662-1.

COMPONENT CHANGES

X1 (Converter) is changed from 2N172 to 2N253.

X2 (1st. IF Amp.) is changed from 2N145 to 2N253.

X3 (2nd. IF Amp.) is changed from 2N147 to 2N254.

L1 (Loop Stick) is changed to part #461512-2.

L2 (Osc. Coil) is changed to part #360708-1.

R2 is decreased from 100K to 3300Ω.

R44 is increased from 1500Ω to 2700Ω.

R5 is omitted and replaced by a buss wire.

R17 is decreased from 100Ω to 68Ω.

A 15K ½ watt resistor is added from the base of X6 to the collector of X6.

A 15K ½ watt resistor is added from the base of X5 to the collector of X5.

A 12K ½ watt resistor is added from the junction of R2 and C6 to ground.

R3 is omitted.

C6 is decreased from .05mfd to .01mfd.

C7 is decreased from 10000mmf to 5000mmf.

C10 is omitted.

C15 is increased from 18mmf to 22mmf.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 13 IN SET 272

H H SCOTT MODEL 232B

H.H. Scott Models 232 and 232A were covered in Photofact Folder 13 — Set 272.

Model 232B is electrically identical to the models covered except for the following changes.

COMPONENT CHANGES

C4 is omitted.

R11 is decreased from 2.2meg to 1.5meg.

DAMPING NETWORK ADDED

A damping network has been added to model 232B. A partial schematic showing the added circuit is given on the reverse side.

(Continued on Reverse Side)

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 326

ADMIRAL CHASSIS 20SY4EF, ES, FF, LS

Admiral Models CS23A1W, CS23A2W, CS23A3W, CS23A6, CS23A7, CS23B1, CS23B2, CS23B3, CS23B16, CS23B17, CS23B26, CS23B27, CS25B6, CS25B7, CS25B16, CS25B17, TS23B1, TS23B2, TS23B6, TS23B6N, TS23B7, TS23B16, TS23B17, TS23B26, TS23B27, TS2301DRW, TS2302DRW and TS2303DRW (Ch. 20SY4BF, E, EF, ES, F, FF, L, LF, LS) were covered in Photofact Folder 2 — Set 326.

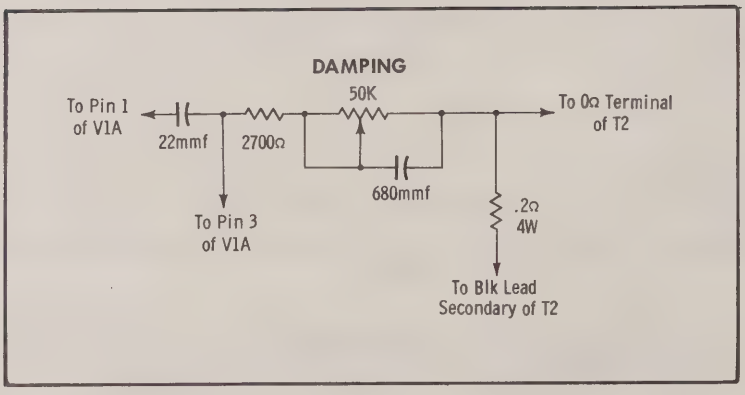
The following production change was made during late production.

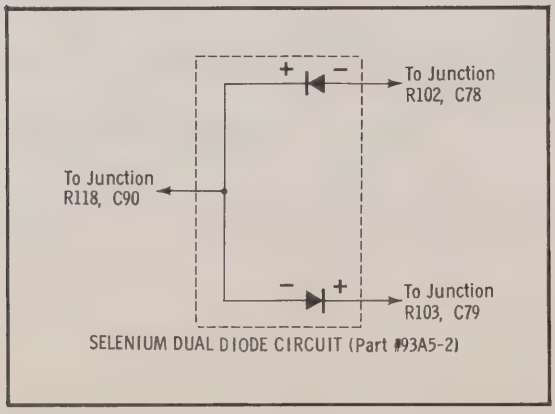
Chassis 20SY4EF 20SY4ES 20SY4FF 20SYLLS Run 25 and higher

HORIZONTAL AFC CIRCUIT CHANGED

In receivers using chassis 20SY4EF, ES, FF, LS stamped Run 25 and higher, V15 (Horiz. AFC) was changed to a wired-in dual selenium diode (Part #93A5-2). A partial schematic showing the new circuit is given on the reverse side.

(Continued on Reverse Side)

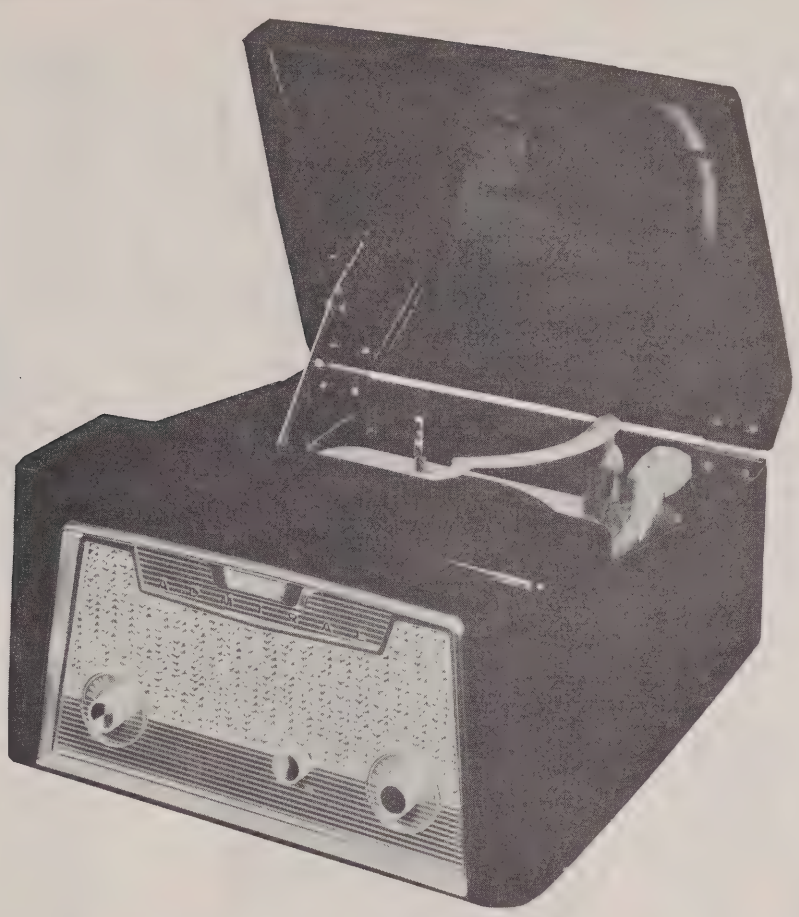

DAMPING
To Pin 1
of V1A
22mmf
2700Ω
50K
680mmf
To 0Ω Terminal
of T2
To Pin 3
of V1A
.2Ω
4W
To Blk Lead
Secondary of T2


+
−
To Junction
R102, C78
To Junction
R118, C90
−
+
To Junction
R103, C79
SELENIUM DUAL DIODE CIRCUIT (Part #93A5-2)

PHOTOFACT* Folder
*TRADE-MARK
ELECTRONIC INDUSTRIES ASSOCIATION EIA MEMBER

ADMIRAL
CHASSIS 5RP4, 5RP4A

ADMIRAL
CHASSIS 5RP4, 5RP4A



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ADMIRAL
CHASSIS 5RP4, 5RP4A

TRADE NAME	Admiral Models 5RP41 (Ch. 5RP4), 5RP42 (CH. 5RP4A)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	AC Operated AM Receiver With 4 Speed Automatic Record Changer
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.23 Amp. @ 117 Volts AC (23 Watts Without Motor)
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. This step should be made after chassis and antenna are mounted in cabinet.

RECORD CHANGER RC606A OR RC606A-1 USED IN MODEL 5RP41
RECORD CHANGER RC626A OR RC626A-1 USED IN MODEL 5RP42

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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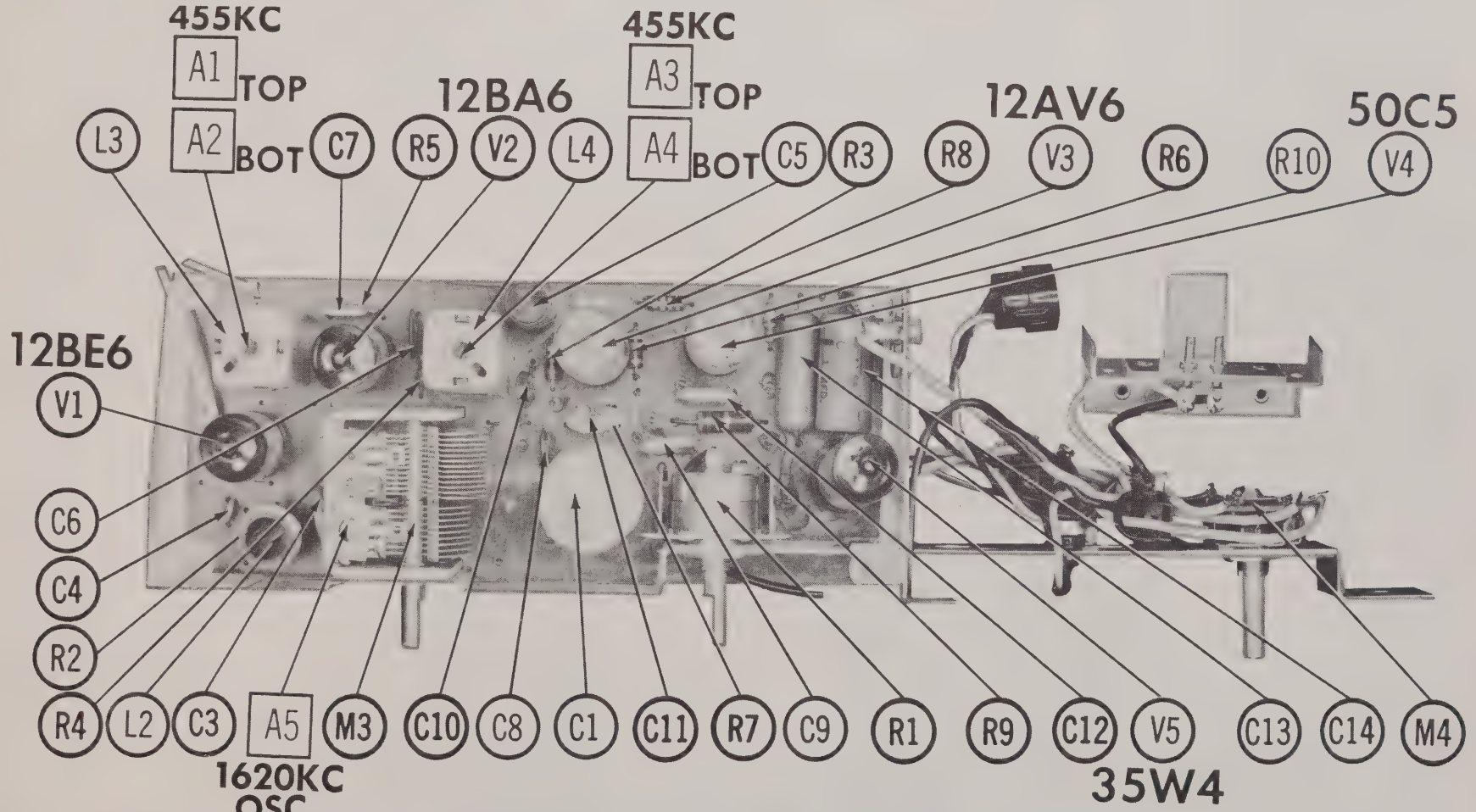


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■70	150	67C30-5 ①	PRS150V8040	BBRD8415	WD220	TDLD-11	MTD-303	TVA-2460
B	▲30	150							

① Early production versions use a three section unit (70-70-20MFD) Part #67C30-4.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	2.5-30		66A33-1							
C3	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4	47		65D10-80	NPO-SI 47	TCZ-47	C10Q47C	TCO-47	ZT-5447	5TCC-Q47	NPO
C5	.1	200	64B16-53			BC2P1J		ACE401	2SE-P10	
C6	2000		65D10-125	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C7	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	220		65D10-83	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	Note 1
C9	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	220		65D10-83	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C11	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	10000		65D10-41	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C13	.047	400	64B17-28	P488N-047	DF-503	CUB2S47		GEM-4147	4TM-S47	
C14	.1	400	64A3-15	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

Note 1. Not used in chassis 5RP4A

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	75C25-8	B-70-S	A47-1Meg-Z	Q13-137	U53	Volume (Note 1)
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	

Note 1. Tapped control used in early versions of chassis 5RP4. Part #75B34-1 used in chassis 5RP4A.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R2	22K		60B8-223	
R3	1Meg		60B8-105	
R4	1500Ω		60B8-152	
R5	120Ω		60B8-121	
R6	4.7Meg		60B8-475	
R7	270K		60B8-274	
R8	470K 5%		60B8-474	
R9	1200Ω	1	60B14-122	Note 1
R10	150Ω		60B8-151	

Note 1. Some versions may use 1000Ω in this application (Part #60B14-102).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2400Ω	3-4Ω	Part of Spkr.	2Ll03	A-2928	A-3876	22S46	S-1X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	78C124-2 ①	52A1	① Includes T1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Stick	69B164-2				Includes C2
L2	Osc. Coil	69A217-1				
L3	Input IF	72C170-2	16-6780	BC-356	13-PC9	
L4	Output IF	72C170-3	16-6780	BC-357	13-PC10	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	409A17	416-2	N8-2	52-2	PFT-1	Model 5RP41
	409B21	55T or 81-TB	GD	56	PT-1	Model 5RP42

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	98C15-29	† CRA-552 or ♦ CRA-552D	† W64AGS or ♦ W64AGD	Model 5RP41
	98C15-44	* JP-35 or † JPS-35 or ♦† JPS-35SD or ♦ JPS-35D	* W35TPA or † W35TPS or †♦ W35DS or ♦ W35TPD	Model 5RP42

* Metal † Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuning Cap	68B66-2	2 Gang (Ant. 38-360MMF)
M4	Switch	76B34-1	Radio-Phono

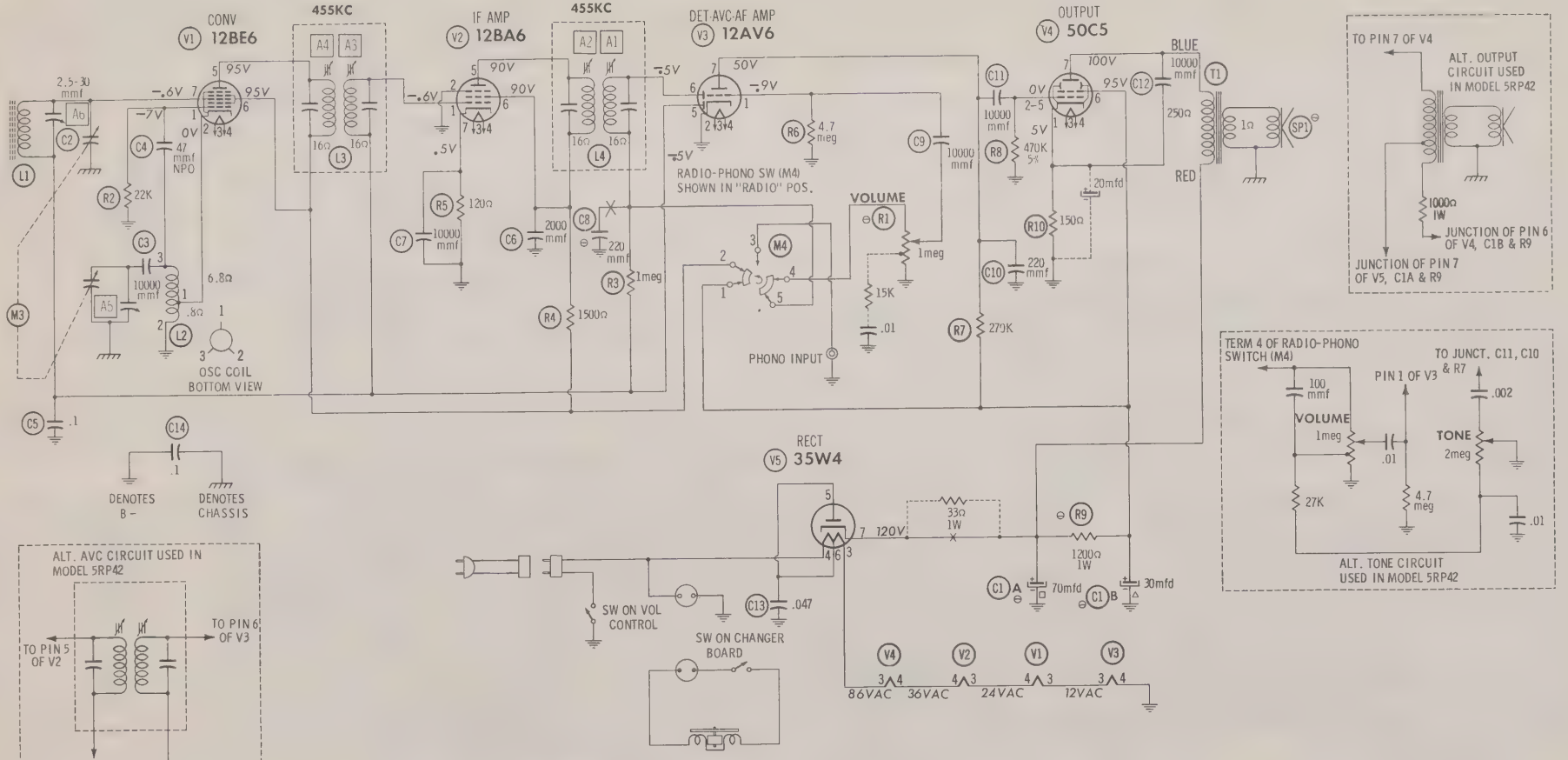
CABINETS & CABINET PARTS

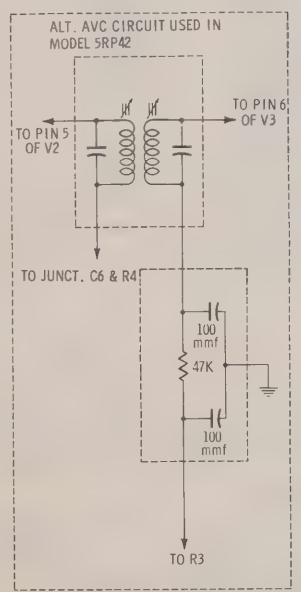
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33C197-9	Radio-Phono & Tuning
Knob	33C197-7	On-Off-Volume & Tone
Cabinet Bottom	34E63-13	Ebony, Model 5RP41
Cabinet Bottom	34E63-14	Mahogany, Model 5RP42
Cabinet Cover	34E63-4	Ebony, Model 5RP41
Cabinet Cover	34E63-6	Mahogany, Model 5RP42
Escutcheon	23D265-2	Model 5RP41
Escutcheon	23D265-1	Model 5RP42

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)





DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	12Ω	24Ω	†1200Ω	†1200Ω	2Meg
V2	12BA6	2Meg	0Ω	24Ω	36Ω	†2700Ω	†2700Ω	120Ω
V3	12AV6	4.7Meg	0Ω	12Ω	0Ω	2Meg	1Meg	†270K
V4	50C5	150Ω	470K	86Ω	36Ω	470K	†1200Ω	†250Ω
V5	35W4	NC	NC	86Ω	110Ω	100Ω	100Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

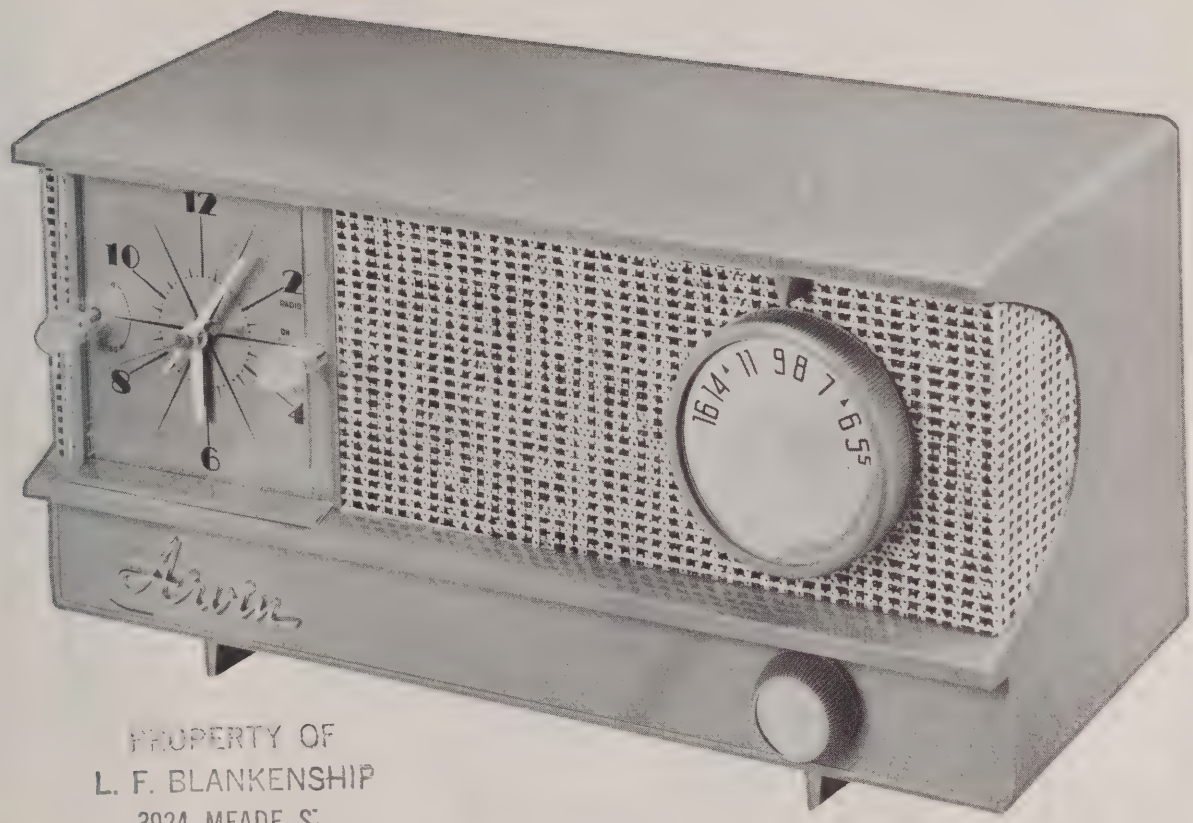
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ARVIN MODELS
5571, 5572 (Ch. 1.41900)

ARVIN MODELS
5571, 5572 (Ch. 1.41900)



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3924 MEADE ST.
DENVER, COLORADO

ARVIN MODELS
5571, 5572 (Ch. 1.41900)

TRADE NAME	Arvin Models 5571, 5572 (Ch. 1.41900)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.27 Amp. @ 117 Volts AC (28 Watts Without Clock)
TUNING RANGE—BROADCAST	540KC - 1670KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1670KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2 & 3 until no further improvement is noted.

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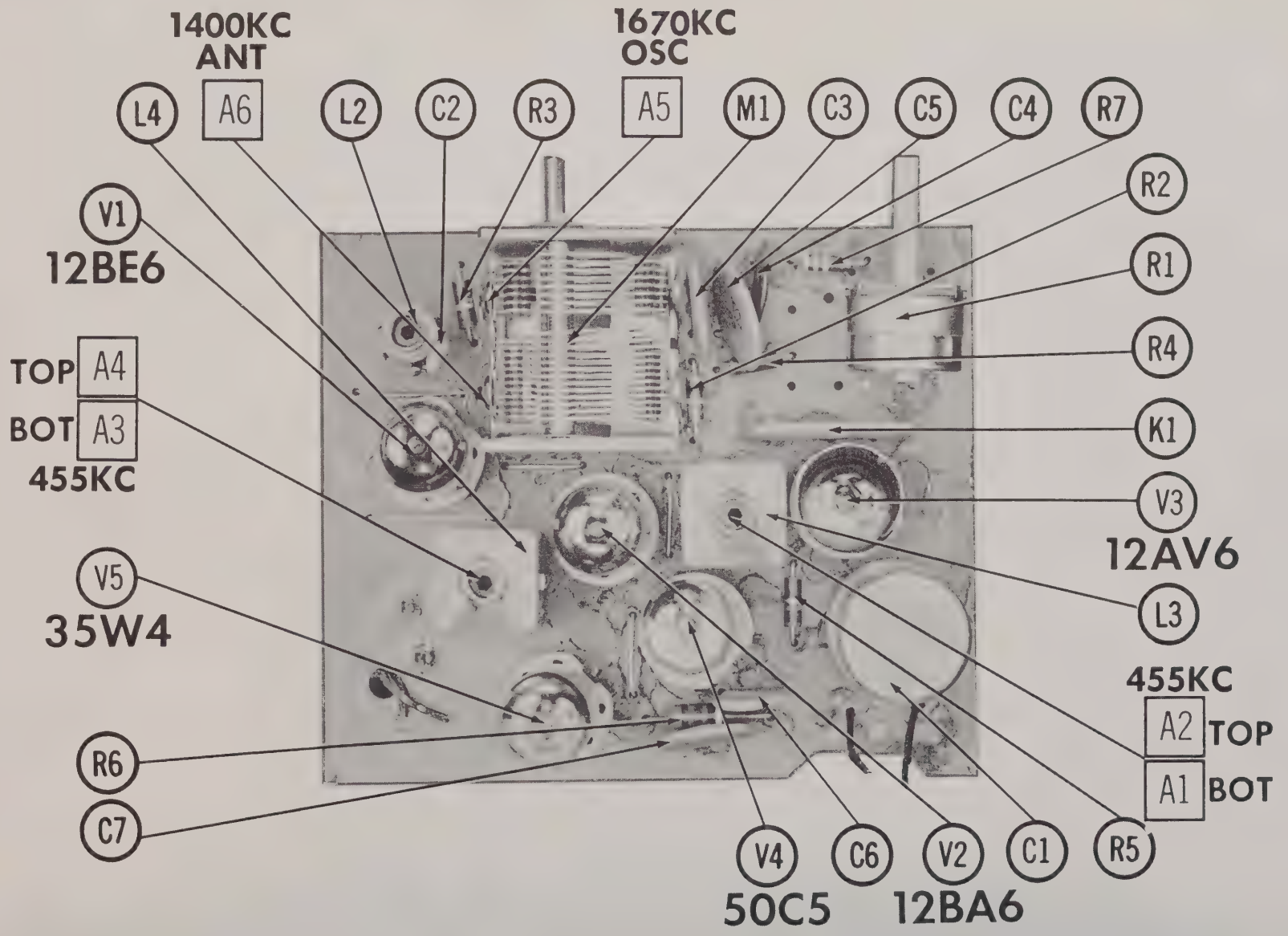


CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	43672	AFH2-15-05	BBRD5315	PFP213.1	TDLD-8	MTD-301	TVA-2450
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	①
C3	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C4	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C5	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C6	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	20000			BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	

① Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	44746					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		ARVIN PART No.	NOTES
	OHMS	WATT		
R2	100K			
R3	22K			
R4	2.2meg			

ITEM No.	RATING		ARVIN PART No.	NOTES
	OHMS	WATT		
R5	120Ω			
R6	1200Ω	1		
R7	330K			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ARVIN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	3-4Ω	42700-18	Z1101	A-3025	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	44888	4A07	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARVIN PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Ant.	44706-2					Note 1
L2	Osc. Coil	43644-5					
L3	Input IF	44282-1					
L4	Output IF	44282-1					

Note 1. Includes cabinet back. Part #44706-1 used in Model 5571.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ARVIN PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	2000mmf, 5000mmf, 250mmf, 220mmf, 470K, 470K, 6.8meg	43743-1	Aerovox Centralab Sprague	PA-511 PC-150 DT-4

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap	43987	2 Gang
M2	Clock	44551-061	Model 5572
	Clock	44622-061	Model 5571

CABINETS & CABINET PARTS

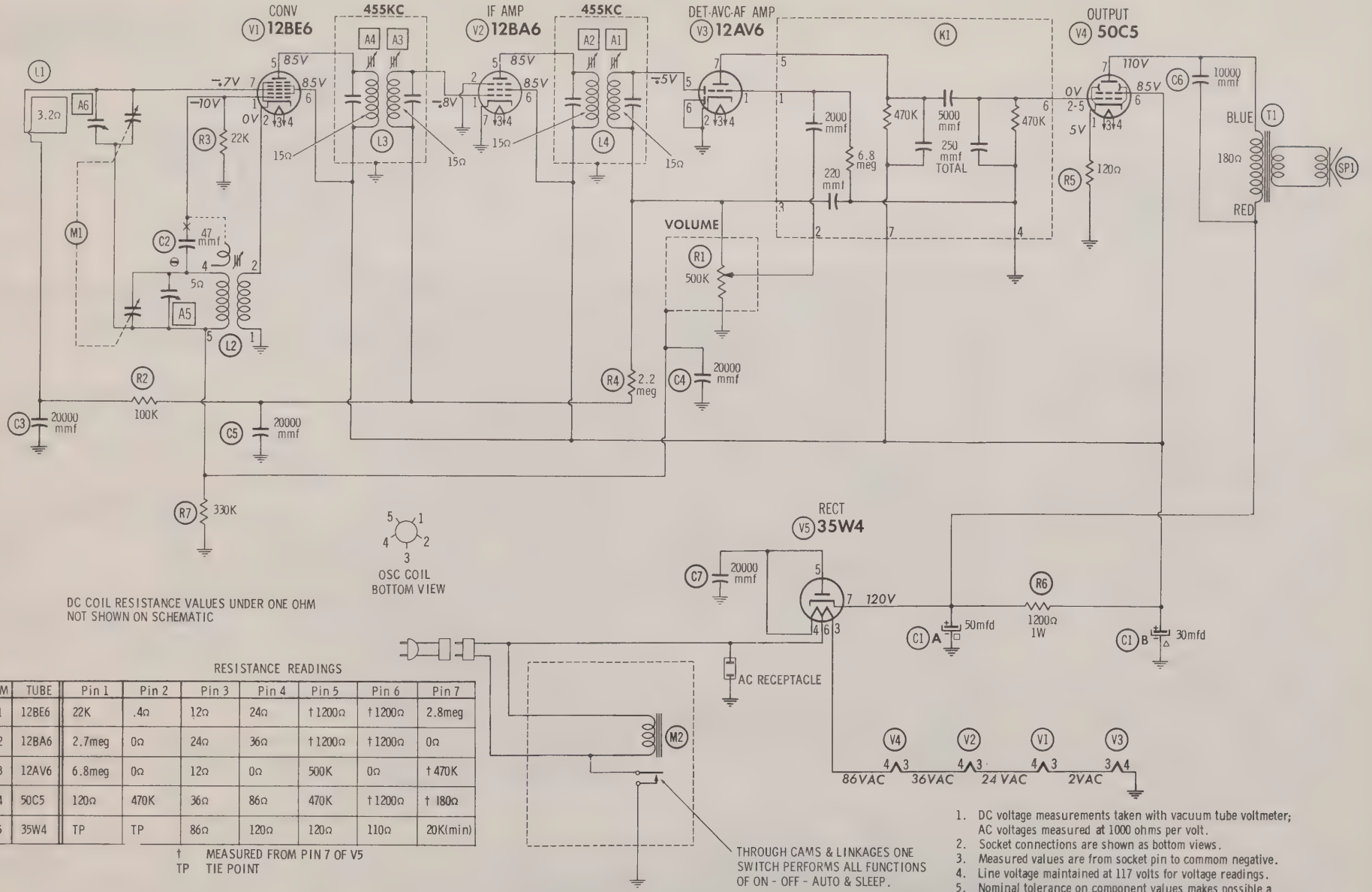
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	44691-19	Tuning, Model 5572 Charcoal
Knob	44691-73	Tuning, Model 5572 Flame
Knob	44689-29	Tuning, Model 5571 Black
Knob	44692-19	On-Off-Volume, Model 5572 Charcoal
Knob	44692-73	On-Off-Volume, Model 5572 Flame
Knob	44690-29	On-Off-Volume, Model 5571 Black
Cabinet	44702-19	Model 5572 Charcoal
Cabinet	44702-73	Model 5572 Flame
Cabinet	44707-17	Model 5571 Ivory
Cabinet	44707-46	Model 5571 Green
Crystal	44697-2	Clock, Model 5572
Crystal	44697-1	Clock, Model 5571

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.4Ω	12Ω	24Ω	†1200Ω	†1200Ω	2.8meg
V2	12BA6	2.7meg	0Ω	24Ω	36Ω	†1200Ω	†1200Ω	0Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V4	50C5	120Ω	470K	36Ω	86Ω	470K	†1200Ω	† 180Ω
V5	35W4	TP	TP	86Ω	120Ω	120Ω	110Ω	20K(min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

*TRADE MARK

HARMAN-KARDON
MODEL A-1040 "Trend II"

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

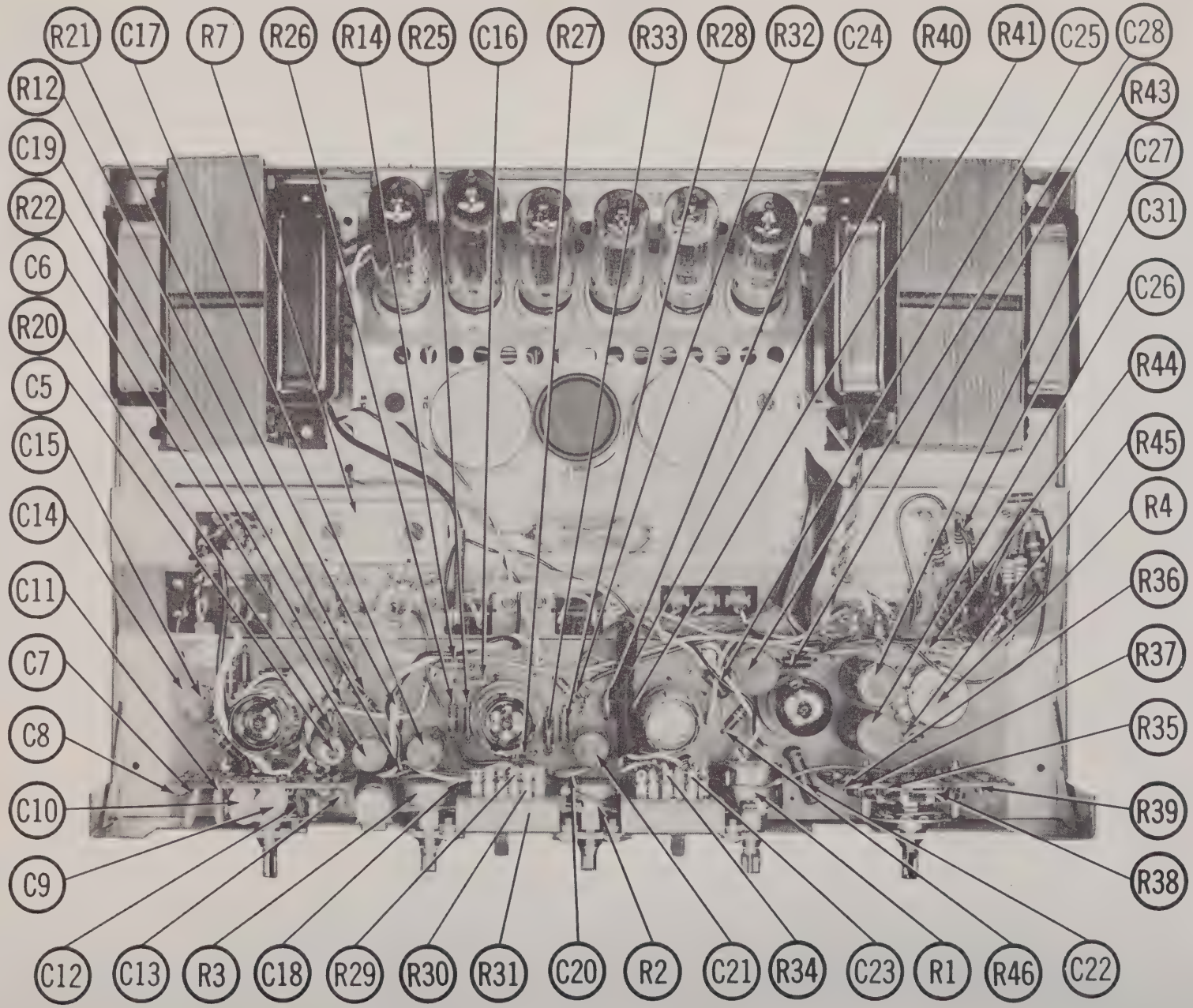
HARMAN-KARDON
MODEL A-1040 "Trend II"

HARMAN-KARDON
MODEL A-1040 "Trend II"

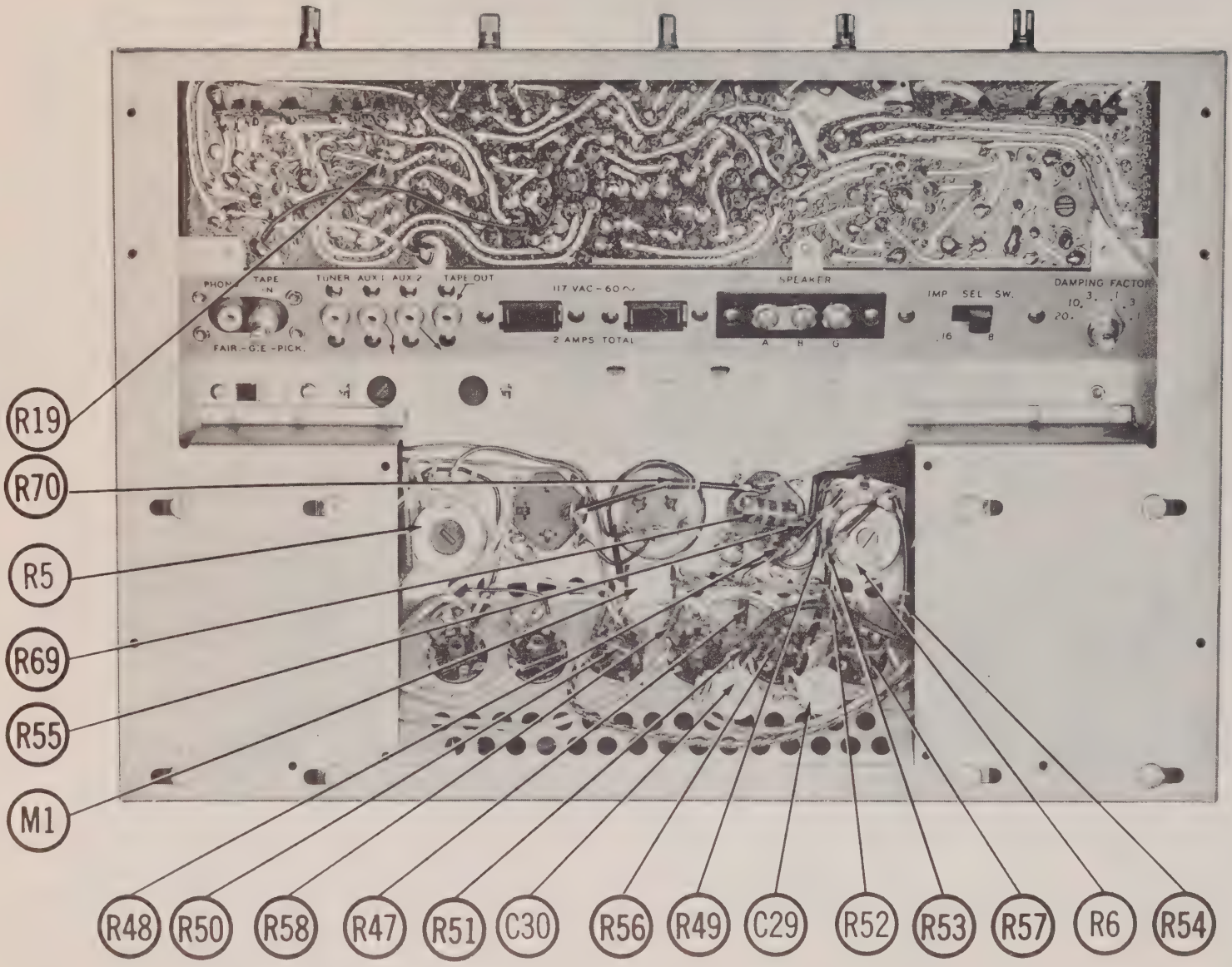
TRADE NAME	Harman-Kardon Model A-1040 "Trend II"
MANUFACTURER	Harman-Kardon, Inc., 520 Main St., Westbury, L.I., N.Y.
TYPE SET	AC Operated 6 Channel 40 Watt Andio Amplifier
TUBES (Ten)	Types 12AX7 Phono Preamplifier, 12AX7 Cath. Follower-AF Amp., 12AV6 AF Amplifier, 12AT7 AF Amp-Phase Inv., (4) 12AB5 Output, (2) EZ81 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .83 Amp. @117 Volts AC (84 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America



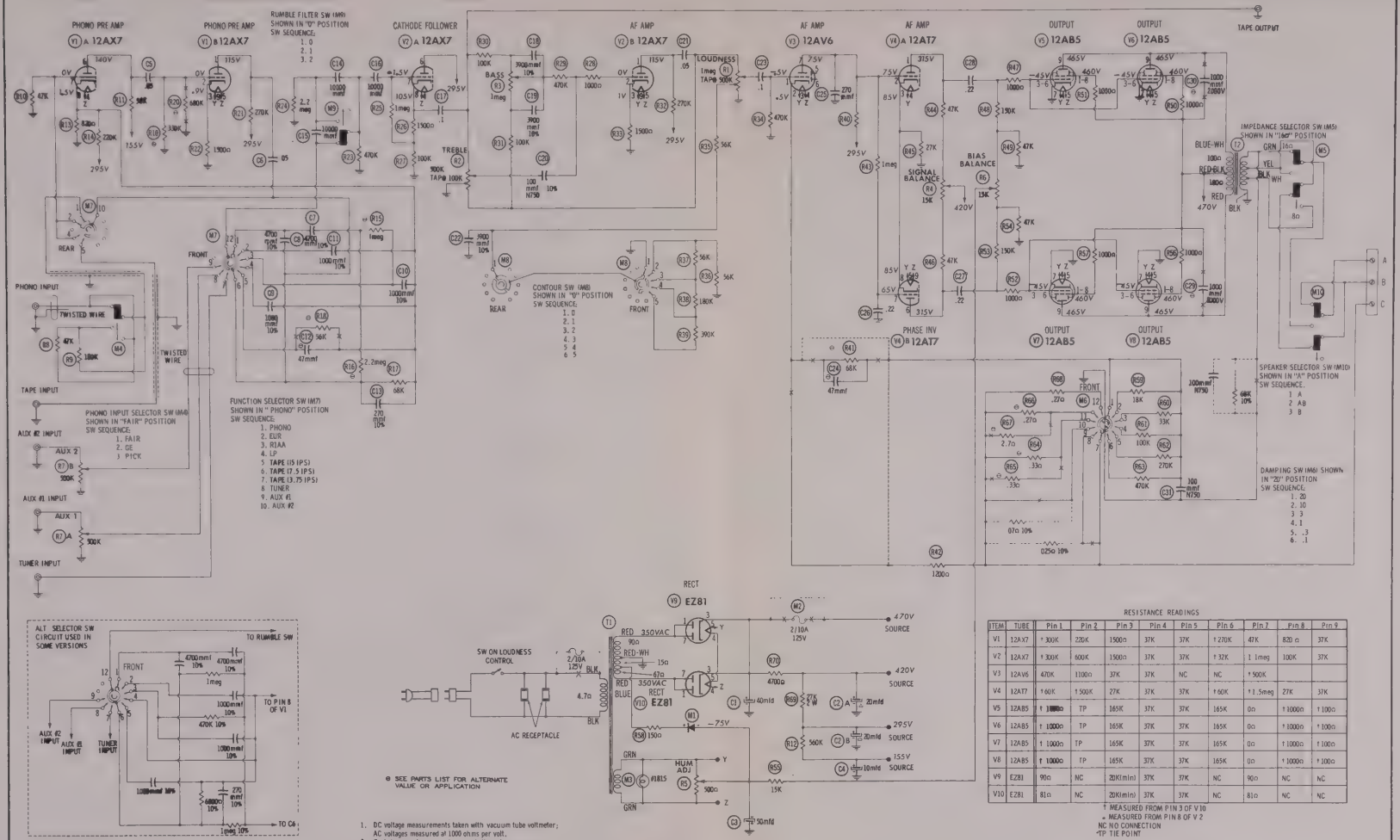
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

HARMAN-KARDON
MODEL A-1040 "Trend II"


PHONO PRE AMP
V1 A 12AX7
PHONO PRE AMP
V1 B 12AX7
RUMBLE FILTER SW (M9) SHOWN IN "0" POSITION SW SEQUENCE: 1. 0 2. 1 3. 2
CATHODE FOLLOWER
V2 A 12AX7
AF AMP
V2 B 12AX7
AF AMP
V3 12AV6
AF AMP
V4 A 12AT7
OUTPUT
V5 12AB5
OUTPUT
V6 12AB5
TAPE OUTPUT
LOUDNESS
TREBLE
BIAS BALANCE
SIGNAL BALANCE
IMPEDANCE SELECTOR SW (M5) SHOWN IN "16Ω" POSITION
BLUE-WH
GRN
YEL
BLK
WH
RED-BLK
RED
PHASE INV
V4 B 12AT7
OUTPUT
V7 12AB5
OUTPUT
V8 12AB5
CONTOUR SW (M8) SHOWN IN "0" POSITION SW SEQUENCE: 1. 0 2. 1 3. 2 4. 3 5. 4 6. 5
FUNCTION SELECTOR SW (M7) SHOWN IN "PHONO" POSITION SW SEQUENCE: 1. PHONO 2. EUR 3. RIAA 4. LP 5. TAPE (15 IPS) 6. TAPE (7.5 IPS) 7. TAPE (3.75 IPS) 8. TUNER 9. AUX #1 10. AUX #2
PHONO INPUT SELECTOR SW (M4) SHOWN IN "FAIR" POSITION SW SEQUENCE: 1. FAIR 2. GE 3. PICK
SPEAKER SELECTOR SW (M10) SHOWN IN "A" POSITION SW SEQUENCE: 1. A 2. AB 3. B
DAMPING SW (M6) SHOWN IN "20" POSITION SW SEQUENCE: 1. 20 2. 10 3. 3 4. 1 5. .3 6. .1
PHONO INPUT
TWISTED WIRE
TAPE INPUT
AUX #2 INPUT
AUX #1 INPUT
TUNER INPUT
REAR
FRONT
ALT SELECTOR SW CIRCUIT USED IN SOME VERSIONS
TO RUMBLE SW
TO PIN 8 OF V1
TO C4
AUX #2 INPUT
AUX #1 INPUT
TUNER INPUT
RECT
V9 EZ81
V10 EZ81
SW ON LOUDNESS CONTROL
AC RECEPTACLE
HUM ADJ
#1815
470V SOURCE
420V SOURCE
295V SOURCE
155V SOURCE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

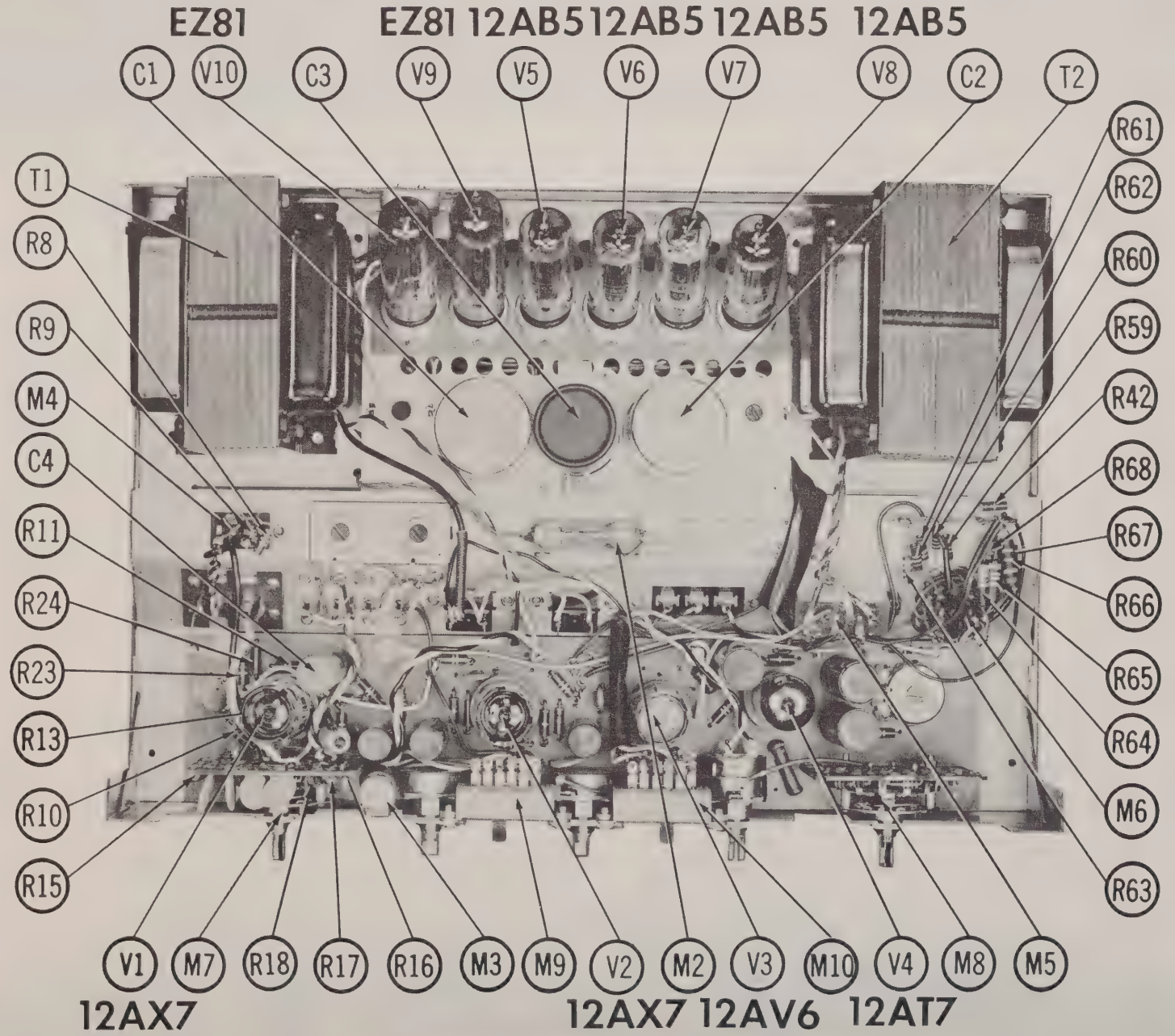
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†300K	220K	1500Ω	37K	37K	†270K	47K	820 Ω	37K
V2	12AX7	†300K	600K	1500Ω	37K	37K	†32K	1 1meg	100K	37K
V3	12AV6	470K	1100Ω	37K	37K	NC	NC	†500K		
V4	12AT7	†60K	†500K	27K	37K	37K	†60K	†1.5meg	27K	37K
V5	12AB5	† 1000Ω	TP	165K	37K	37K	165K	0Ω	†1000Ω	†100Ω
V6	12AB5	† 1000Ω	TP	165K	37K	37K	165K	0Ω	†1000Ω	†100Ω
V7	12AB5	† 1000Ω	TP	165K	37K	37K	165K	0Ω	†1000Ω	†100Ω
V8	12AB5	† 1000Ω	TP	165K	37K	37K	165K	0Ω	†1000Ω	†100Ω
V9	EZ81	90Ω	NC	20K(min)	37K	37K	NC	90Ω	NC	NC
V10	EZ81	81Ω	NC	20K(min)	37K	37K	NC	81Ω	NC	NC

† MEASURED FROM PIN 3 OF V10
• MEASURED FROM PIN 8 OF V-2
NC NO CONNECTION
*TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

387-8



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamplifier	12AX7	
V2	Cath. Follower-AF Amp.	12AX7	
V3	AF Amplifier	12AV6	
V4	AF Amplifier-Phase Inv.	12AT7	
V5	Output	12AB5	
V6	Output	12AB5	
V7	Output	12AB5	
V8	Output	12AB5	
V9	Rectifier	EZ81	
V10	Rectifier	EZ81	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	475	JE1071739	AFH1-56-10	A0516	FP284	TMD-61	S-300	TVL-1820
C2A ▲	20	475	JE1071740	AFH2-69	B0500		TMD-61	D-270	TVL-2935
B ▲	20	475							
C3	50	150	JE1021711	AFH1-18	A0200	FP115	TMS-20	S-080	TVL-1415
C4	10	150		PRS150V10	BBR10-150	TC42	TD-10-150	MT-1510	TVA-1406

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	Harman-Kardon PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	.05	200		P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C6	.05	400				BC6S47J		ACE615	4SE-S47	
C7	4700					1R5D47			MS-247	10%
C8	4700					1R5D47			MS-247	10%
C9	1000					1R5D1	ED-1000	MCB255	MS-21	10%
C10	1000					1R5D1	ED-1000	MCB255	MS-21	10%
C11	1000					1R5D1	ED-1000	MCB255	MS-21	10%
C12	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	①
C13	270			NPO-S1270	D6-271	5R5T27	ED-270		MS-327	10%
C14	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C15	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C16	10000			BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C17	.1	200				BC2P1J		ACE401	2SE-P10	
C18	3900					1R5D39			MS-239	10%
C19	3900					1R5D39			MS-239	10%
C20	100			N750-DI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750 10%
C21	.05	400				BC6S47J		ACE615	4SE-S47	
C22	3900					1R5D39			MS-239	10%
C23	.1	200				BC2P1J		ACE401	2SE-P10	
C24	47			BPD-000047	DD-470	L10Q47	ED-47	UC-5447	5GA-Q47	①
C25	270			SI270	D6-271	LT6T27	GP-270	UC-5327	5GA-T27	
C26	.22	400				BC6P22J		ACE6022	4SE-P22	
C27	.22	400				BC6P22J		ACE6022	4SE-P22	
C28	.22	400				BC6P22J		ACE6022	4SE-P22	
C29	1000	2000		HVD-30-1000	DD30-102	HVB20D1	HD3-1000	DC3021	20HKB-D1	①
C30	1000	2000		HVD-30-1000	DD30-102	HVB20D1	HD3-1000	DC3021	20HKB-D1	①
C31	100			N750-DI100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750

① Not Used in Some Versions

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	RV1021636					Loudness, Tap ⓐ 500K
B	Switch							Power On-Off
R2	500K	½	RV1021634					Treble, Tap ⓐ 100K
R3	1meg	½	RV1021635					Bass
R4	15K	½	RV1021725					Signal Balance
R5A	500Ω	½	RV1021709	AB-4	A47-500-S	B11-103	TA52L	Hum Adjustment
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R6A	15K	½	RV1021708	AB-22	A47-15K-S	B11-118	TA153L	Bias Balance
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	
R7A	500K	½	RV1071756	BX-59	A47-500K-S	B11-133	TA55L	Aux. 1
B	500K	½		BX-59	A47-500K-S	B11-133	TA55L	Aux. 2
C	Shaft			Not Req.	FKS-1/4 *	TM1-Kit *	Not Req.	* Two Required

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Harman-Kardon PART No.	NOTES
R8	47K			
R9	180K			
R10	47K			
R11	56K			
R12	560K			
R13	820Ω			
R14	220K			
R15	1meg			Note 1
R16	2.2meg			Note 2
R17	68K			
R18	56K			Note 3
R19	330K			Note 4
R20	680K			Note 3
R21	270K			
R22	1500Ω			
R23	470K			
R24	2.2meg			
R25	1meg			
R26	1500Ω			
R27	100K			
R28	1000Ω			
R29	470K			
R30	100K			
R31	100K			
R32	270K			
R33	1500Ω			
R34	470K			
R35	56K			
R36	56K			
R37	56K			
R38	180K			
R39	390K			
R40	470K			
R41	68K			Note 3
R42	1200Ω			
R43	1meg			
R44	47K			
R45	27K			
R46	47K			
R47	1000Ω			
R48	150K			
R49	47K			
R50	1000Ω			
R51	1000Ω			
R52	1000Ω			
R53	150K			
R54	47K			
R55	15K			
R56	1000Ω			
R57	1000Ω			
R58	150Ω			
R59	18K			
R60	33K			
R61	100K			
R62	270K			
R63	470K			
R64	0.33Ω			Note 5
R65	0.33Ω			Note 3
R66	0.27Ω			Note 6
R67	2.7Ω			Note 3
R68	0.27Ω			
R69	27K	2		
R70	4700Ω			

Note 1. Some versions may use 470K in this application
Note 2. Some versions may use 1meg in this application
Note 3. Not used in some versions
Note 4. Some versions may use 220K in this application
Note 5. Some versions may use 0.16Ω in this application
Note 6. Some versions may use 0.24Ω in this application

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .83A	720VCT ⓐ .074A Tap ⓐ 65V ⓐ .002A	12V ⓐ 2.6A		FT1071729					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4400Ω CT	16Ω Tap ⓐ 8Ω, 4Ω	FT1071730				22S78 ①		① Use Orig. Shields Do Not Use 250Ω, 500Ω Taps

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Harman-Kardon PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.002A	Z1021726	1159	CR20	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Harman-Kardon PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	2/10A 125V S/B			313.200 (3AG 2/10A 125V S/B)	357001	MDL 2/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M3	Pilot Lamp	KB1071741	#1815
M4	Switch		Fair.-GE-Pick (Slide Type SPDT)
M5	Switch		Impedance Selector (Slide Type SPST)
M6	Switch	ER371057	Damping Factor (Rotary Wafer Type)
M7	Switch	ER1021633	Function (Rotary Wafer Type)
M8	Switch	ER1021632	Contour (Rotary Wafer Type)
M9	Switch		Rumble Filter (Slide Type DPST)
M10	Switch	ES1021717	Speaker (Slide Type DPST)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

ADJUSTMENTS

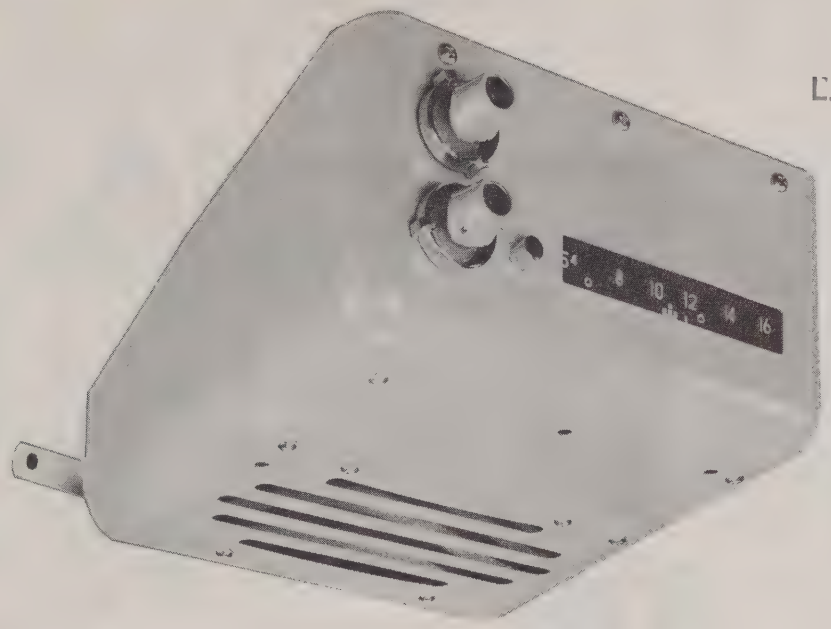
BIAS BALANCE ADJUSTMENT (R6)

This control should be adjusted if an output tube (V5, V6, V7, or V8) is replaced. Connect a suitable load (speaker or resistor) across the speaker terminals and allow the amplifier to warm-up. Connect an oscilloscope across the speaker terminals. With volume control at minimum, adjust R6 for a straight line on the screen of the scope. If an oscilloscope is not available, an AC VTVM may be connected across the speaker terminals and R6 adjusted for a minimum reading on the meter.
(This should be approximately 1-5 millivolt).

SIGNAL BALANCE ADJUSTMENT (R4)

This control should be adjusted if new tubes are installed in the amplifier. The "Bias Balance" control (R6) should be adjusted prior to adjusting R4. Connect an IM analizer, with a signal ratio of 4:1, to the amplifier. Set volume control for maximum output.
Adjust the "Signal Balance" control (R4) for minimum IM.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



INTERNATIONAL
MODEL 86M1

TRADE NAME	International Model 86M1 (For 1958 International "A" Line Trucks)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom Built AM Automobile Receiver With Transistorized Output
TUBES(Six)	Types 12BL6 RF Amplifier, 12AD6 Converter, 12BL6 1st IF Amplifier, 12BL6 2nd IF Amplifier, 12DL8 Det.-AVC-AF Amplifier, 12AL8 Trigger
POWER SUPPLY	12 Volt Storage Battery — RATING 2.2 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High Side to Pin 7 (Grid) of 12AD6 (V2). Low Side to Chassis.	262.5KC (400~ Mod.)	High Freq. End Stop	DC Probe to Point (A) Common to Chassis.	A1, A2, A3	Adjust For Maximum Deflection
2.	.1mfd	"	"	"	"	A4	Adjust For MINIMUM Deflection
3.	Fig. 1	Thru Dummy to Antenna Receptacle	1610KC	"	"	A5, A6, A7	Adjust For Maximum Deflection
	It is not necessary to perform steps 4 and 5 unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) out of coils but not out of coil forms.						
4.	Fig. 1	Thru Dummy to Antenna Receptacle	1610KC	High Freq. End Stop.	DC Probe to Point (A) Common to Chassis.	A5, A6, A7	Adjust For Maximum Deflection
5.	Fig. 1	"	1020KC	Tuner Carriage 9/16" From High Freq. End Stop.	"	A8, A9, A10	Adjust For Maximum Deflection Repeat Steps 4 & 5 With Step 4 Last.
6.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.						

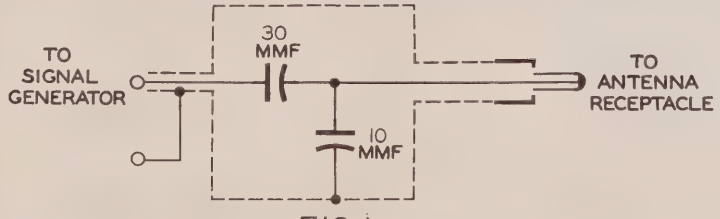


FIG. 1

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	RF Amplifier	12BL6	
V2	Converter	12AD6	
V3	1st IF Amplifier	12BL6	
V4	2nd IF Amplifier	12BL6	
V5	Det. -AVC-AF Amplifier	12DL8	
V6	Trigger	12AL8	

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N176	Output	2N155		2N176/ 2N242	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 500	16	23B539261	AFH2-02-10	B0045	WP200.5			R2452 *
B	▲ 100	16							

* Non Catalog Item

FIXED CAPACITORS

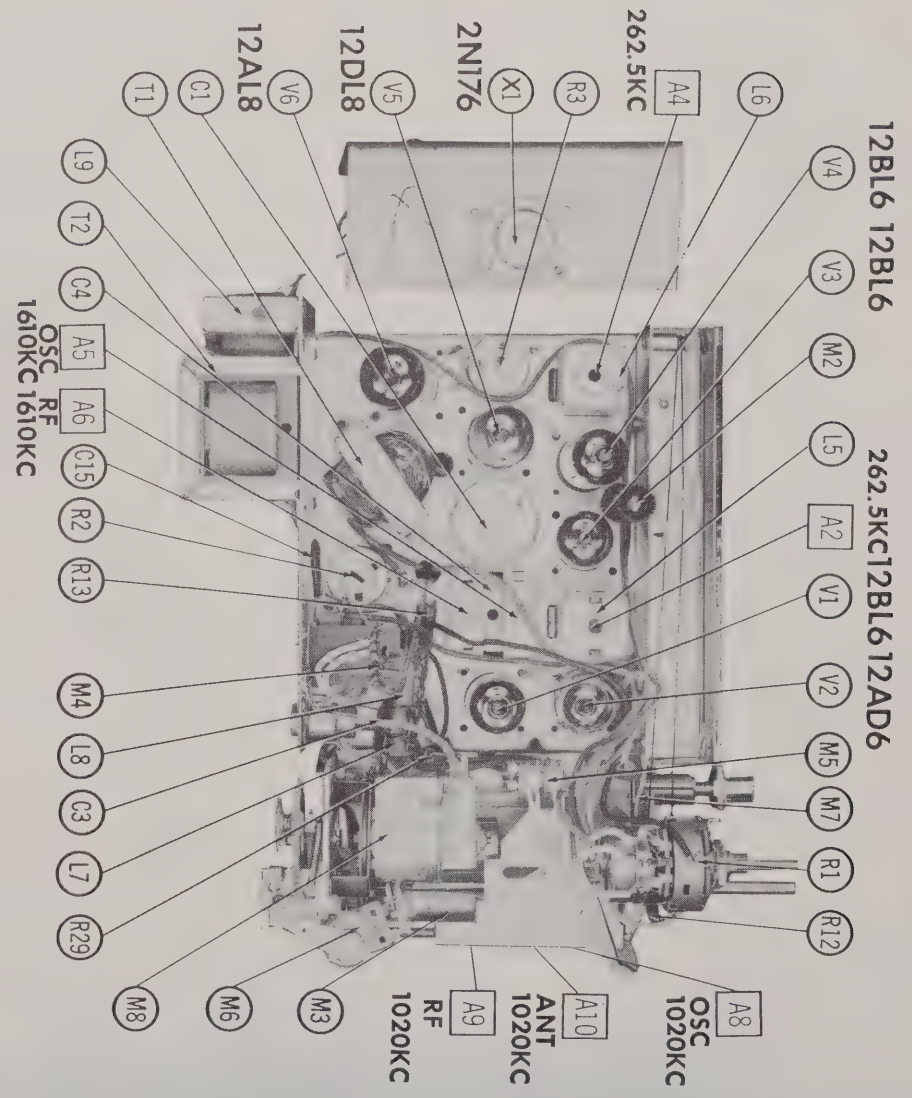
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	20-180		20A481526							
C3	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C4A	50-260									
B	27		20B542094							
C	47									
D	420-490									
C5	.05	200	8R121005	P288N-05	DF-503	CUB2S5		GEM-215	4TM-S5	
C6	220		21K121698		D6-221	L10T22	ED-220		MS-322	10%
C7	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	220		21K121698		D6-221	L10T22	ED-220		MS-322	10%
C9	1.5		21R115959	NPO-S11.5	TCZ-1R5	C10V15C	TCO-1.5	ZT-5515	5TCCB-V15	
C10	100		21R410036	N750-D1100	TCN-100	C10T1U	TC7-100	NT531	5TCU-T1	N750 10%
C11	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C12	100		21R410036	N750-D1100	TCN-100	C10T1U	TC7-100	NT-531	5TCU-T1	N750 10%
C13	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC-511	5HK-S1	
C14	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC-511	5HK-S1	
C15	10000		21R482726	BPD-01	DD-103	BYA6S1	ED-01	DC-511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	Switch		18B542219					Sensitivity
B	1meg	½						Volume
C	Switch							
R2	210Ω	2	18K540718		39-200			Bias (Wire Wound)
R3	2000Ω	2	18K520298		39-2000		FL-2, 5K	Sensitivity

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MOTOROLA PART No.	NOTES
R4	3.3meg		6K119407	
R5	10meg		6R5622	
R6	8200Ω		6K119931	
R7	1800Ω		6K122445	
R8	100K		6K125534	
R9	47K		6K121299	
R10	22K		6K119935	
R11	4700Ω		6K121847	
R12	100Ω		6R6326	
R13	120Ω		6R6270	
R14	6.8meg		6K122321	
R15	5.6meg		6R3988	
R16	1.5meg		6R6460	
R17	47K		6K121299	
R18	2.2meg		6K127001	
R19	6.8meg		6K122321	
R20	10Ω		6K124668	
R21	5.6Ω		17K739323	
R22	0.47Ω		17K488266	
R23			6K540634	Note 1
R24	6.8meg		6K121933	
R25	1.5meg		6R6460	
R26	5600Ω		6R6117	
R27	3.3meg		6K121278	
R28	3300Ω		6R6036	
R29	330Ω		6R6010	
R30	100Ω		6R6326	

Note 1. Temperature compensating unit, 10Ω @ 25° C

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	10:	1	25C542378						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	10Ω	3-4Ω	25K542338						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5½"x7½"	PM	3-4Ω	50C542399	57A1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Ant. Coil	24B537932					Note 1
L2	RF Coil	24B537932					Note 1
L3	RF Choke	24A560200					1120Microhenries
L4	Osc. Coil	24B537931					Note 1
L5	Input IF	24B536693	16-6752	BC-350	12-H1	RF-3	
L6	Output IF	24B533073		BC-316			
L7	RF Choke	24A542379					3.2 Microhenries
L8	RF Choke	24A542379					3.2 Microhenries

Note 1. Part of coil and plate assembly 1V542431

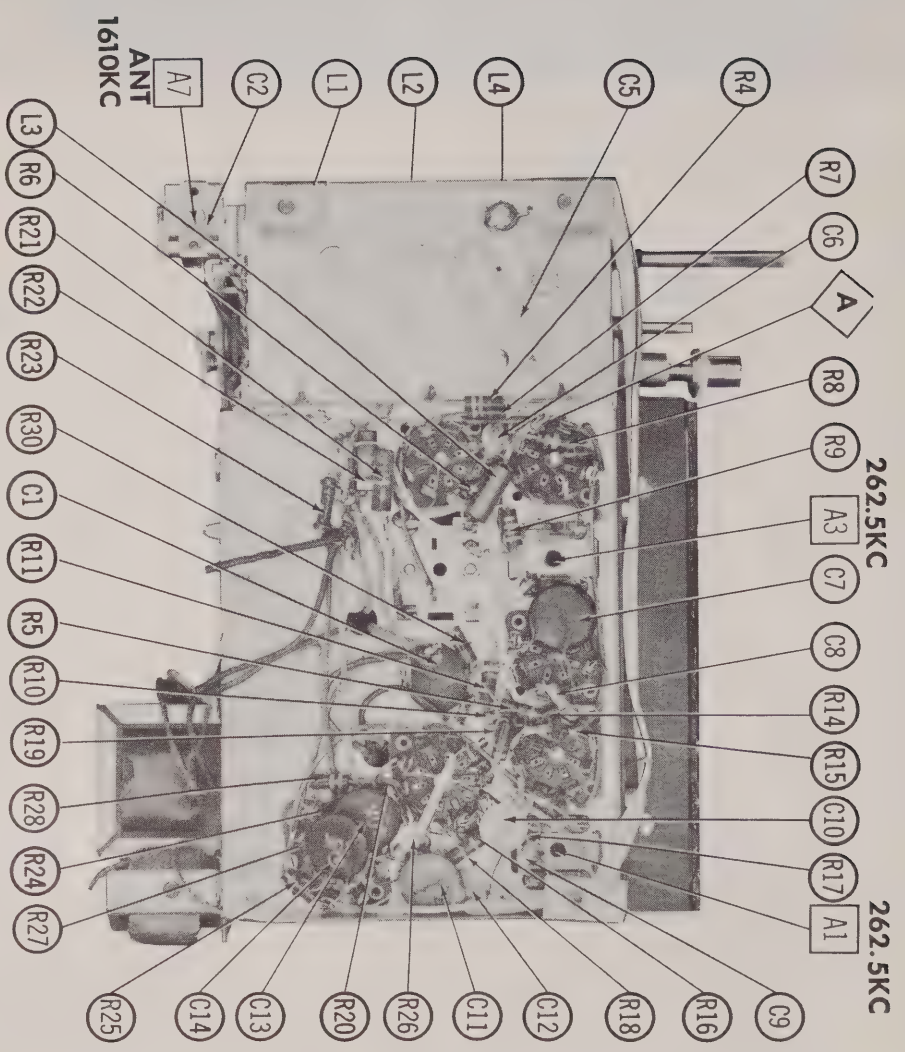
FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L9	2.2A	.9Ω	4Mil. Hy.	25K560034					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	1AG	5A 32V	65R122345	9C542395	301005, (1AG 5A 32V)	155004	AGA5	HAF

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Pilot Light	65R538410	#1892
M3	Tuner	77K542324	MST-237 (Complete)
M4	Switch	40A542391	Search (Leaf Type)
M5	Switch	40K537765	Motor Reversing (Leaf Type)
M6	Solenoid	59A537563	Drive Wheel
M7	Relay	80C539576	Search Button
M8	Motor	59K542419	Tuner Drive
M9	Spark Plate	48K539953	Selenium Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36K592302	Dummy
Knob	36K473550	Search Sensitivity
Knob	36K542332	On-Off-Volume & Tuning
Button	38A542400	Search
Dial Scale	34B542223	
Dial Pointer	52A542227	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661

TRANSISTOR BIAS ADJUSTMENT (R2)

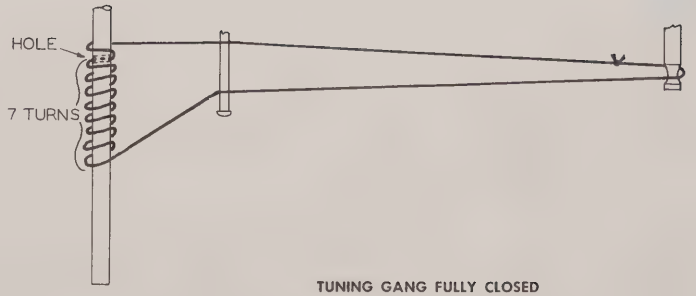
The transistor current should be checked after the transistor is replaced.

1. Set bias control (R2) fully counter-clockwise (maximum resistance)

2. Connect an accurate low range VTVM from the transistor collector (outer case) to chassis.

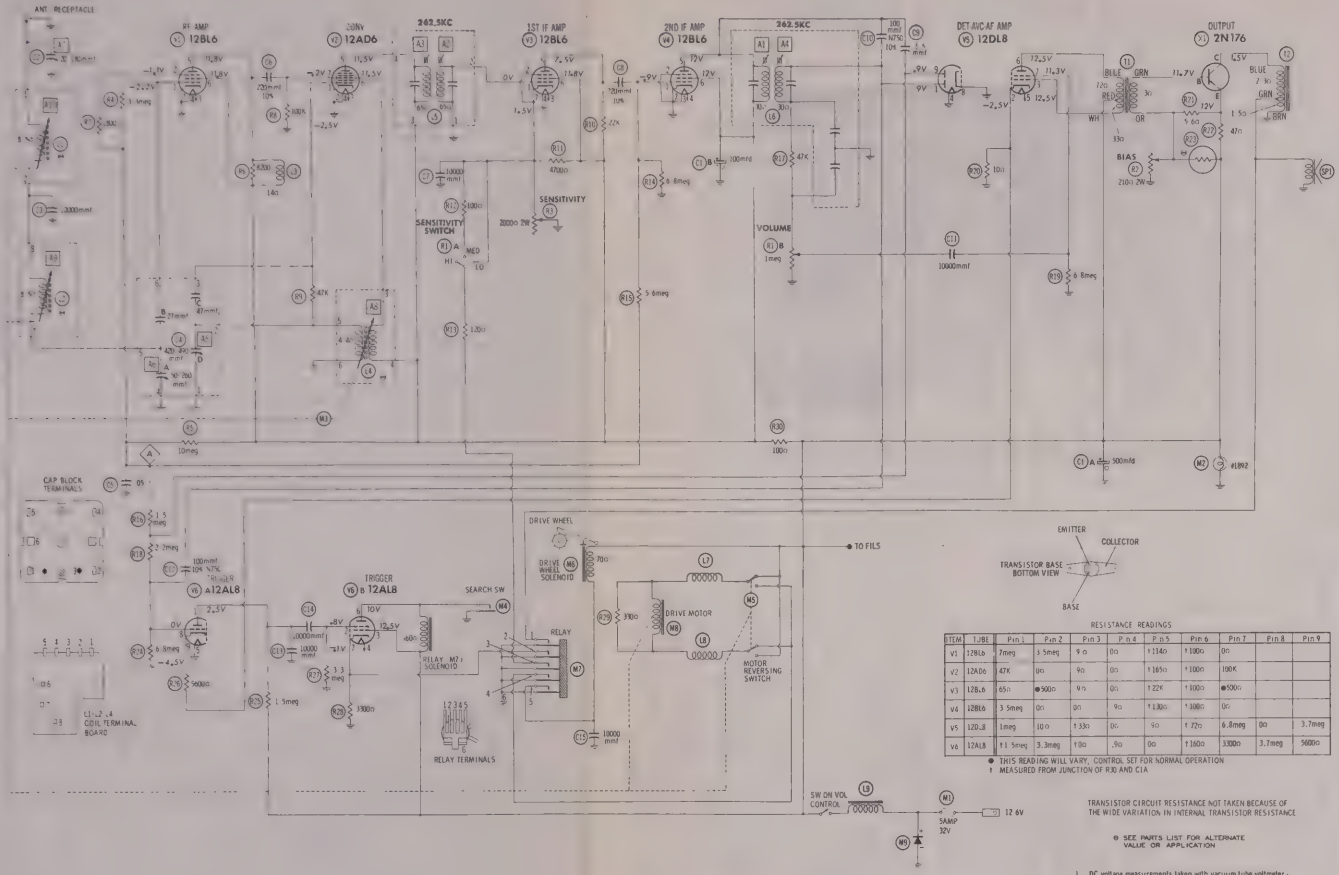
3. Apply power to the receiver and allow a 15 minute warm-up period.

4. Adjust R2 for a reading of .75 volts on the VTVM. This is equivalent to a collector current of 425MA.



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BL6	7meg	3.5meg	9 Ω	0Ω	†114Ω	†100Ω	0Ω		
V2	12AD6	47K	0Ω	9Ω	0Ω	†165Ω	†100Ω	100K		
V3	12BL6	65Ω	●500Ω	9Ω	0Ω	1.22K	†100Ω	●500Ω		
V4	12BL6	3.5meg	0Ω	0Ω	9Ω	†130Ω	†100Ω	0Ω		
V5	12DL8	1meg	120Ω	†33Ω	0Ω	9Ω	†72Ω	6.8meg	0Ω	3.7meg
V6	12AL8	†1.5meg	3.3meg	†0Ω	.5Ω	0Ω	†160Ω	330Ω	3.7meg	560Ω

● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION
† MEASURED FROM JUNCTION OF R30 AND C1A

TRANSISTOR CIRCUIT RESISTANCE NOT TAKEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12 6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

Howard W Sams & Co., Inc. 1958

PHOTOFACT* Folder
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MAGNAVOX
CHASSIS AMP-157AA

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MAGNAVOX
CHASSIS AMP-157AA

MAGNAVOX
CHASSIS AMP-157AA

TRADE NAME	Magnavox Chassis Amp-157AA
MANUFACTURER	Magnavox Co., 2131 Bueter Rd., Fort Wayne 4, Indiana.
TYPE SET	AC Operated Phono Amplifier with 4 Speed Automatic Record Changer
TUBES (Four)	Types 12AX7 AF Amp.-Phase Inv., (2) 6AQ5 Output, 6X5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .53Amp. @ 117 Volts AC (55Watts without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER-SEE SIMILAR COLLARO MODEL RC 456-PHOTOFACT SET 342 FOLDER 3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MAGNAVOX
CHASSIS AMP-157AA

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. - Phase Inv.	12AX7	
V2	Output	6AQ5	
V3	Output	6AQ5	
V4	Rectifier	6X5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	◓ 40	350	270021-43	AFH4-18-40	D0176	FP447.5	TMQ-119	Q-012	R2590*
B	■ 35	350							
C	▲ 30	350							
D	30	350							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	220		250218-5	BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C3	68		250224-426	1469-000068	D6-680	22R5Q68	CY10C680V		MS-468	10%
C4	2000		250218-20	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C5	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	.2	200	250753-4	P288N-22		CUB2P22		GEM-2022	2TM-P22	
C7	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	10000		250218-19	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C9	.047	200	250202-11	P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	1.0	200	250172-9	P288N-1.0		CUB2W1		GEM-21	2TM-M1	
C11	10000	1000	250219-2	DAC-27	DD16-103	BYA10S1M		GEM-1011	BL-S10	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3.3meg	½	220131-4					Volume, Tap ⓐ 700K & 1.5meg ①
R2A	3meg	½	220072-28	B-85	A47-3meg-Z	Q13-140	U57	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	220123-20	B-70-S	A47-1meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	

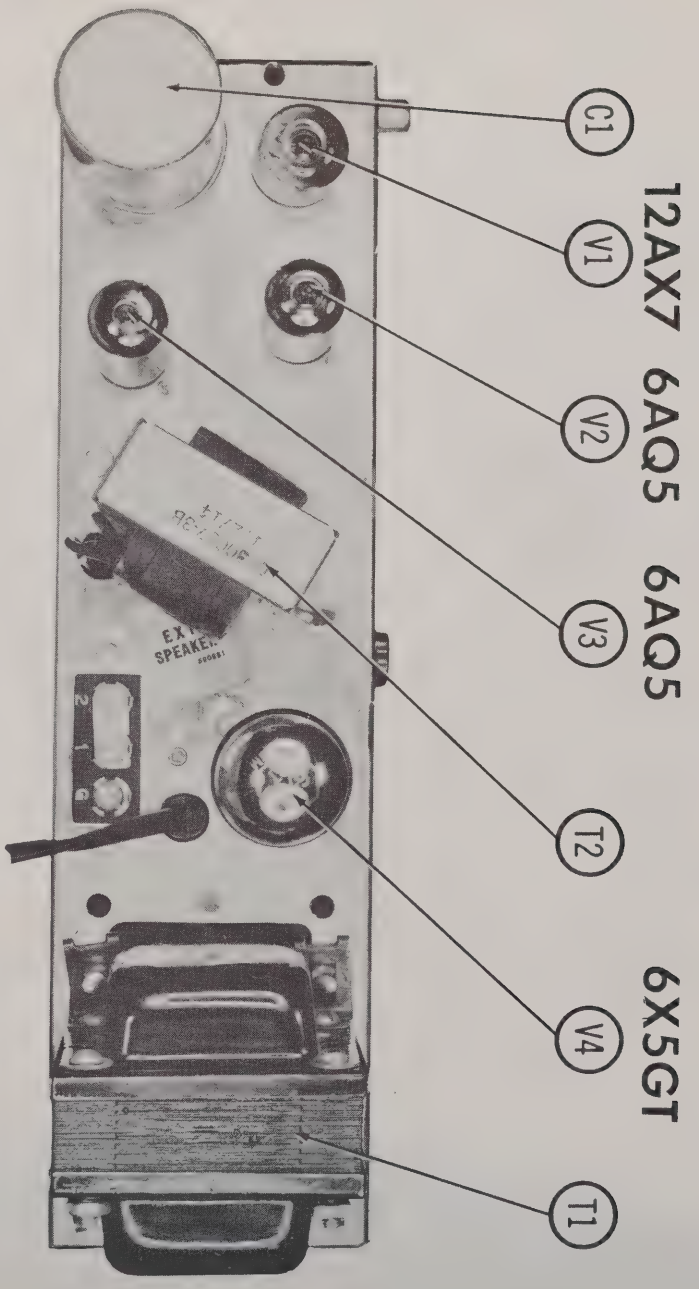
① 1.5 meg tap not used

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MAGNAVOX PART No.	NOTES
R4	4.7meg		230104-106	
R5	470K		230104-94	
R6	470Ω		230104-58	
R7	150K 5%		230104-88	
R8	6800Ω		230104-72	
R9	22K		230104-78	
R10	470K		230104-94	
R11	6800Ω		230104-72	
R12	470K		230104-94	
R13	330Ω	2	230106-56	
R14	1500Ω	2		
R15	220Ω	2	230104-1054	
R16	470K		230104-94	
R17	68K		230104-84	
R18	220K		230104-90	
R19	22K		230104-78	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .53A	480VCT @ .100A	6.3V @ 1.9A		300073-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6600Ω CT	1.6Ω	330037-3①	Z1009	A-2900	A-3852	26S46	S-55Z	① Alternate Part #330037-5

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	6"x9"	PM	3-4Ω	583743 ①	69A31 ①	① Parallel and Phase
SP2	6"x9"	PM	3-4Ω	583680 ①	69A31 ①	
SP3	5"	PM	3-4Ω	580038-1	5A15TZ3.2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA				REMARKS
	MAGNAVOX PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT
M1		81-TBX		56	PT-1

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MAGNAVOX PART No.	JENSEN PART No.	WALCO PART No.	
M2		* JP-35 or † JPS-35 or †♦ JPS-35DS or ♦ JPS-35D	* W35TPA or † W35TPS or †♦ W35DS or ♦ W35TPD	* Metal † Jewel ♦ Diamond

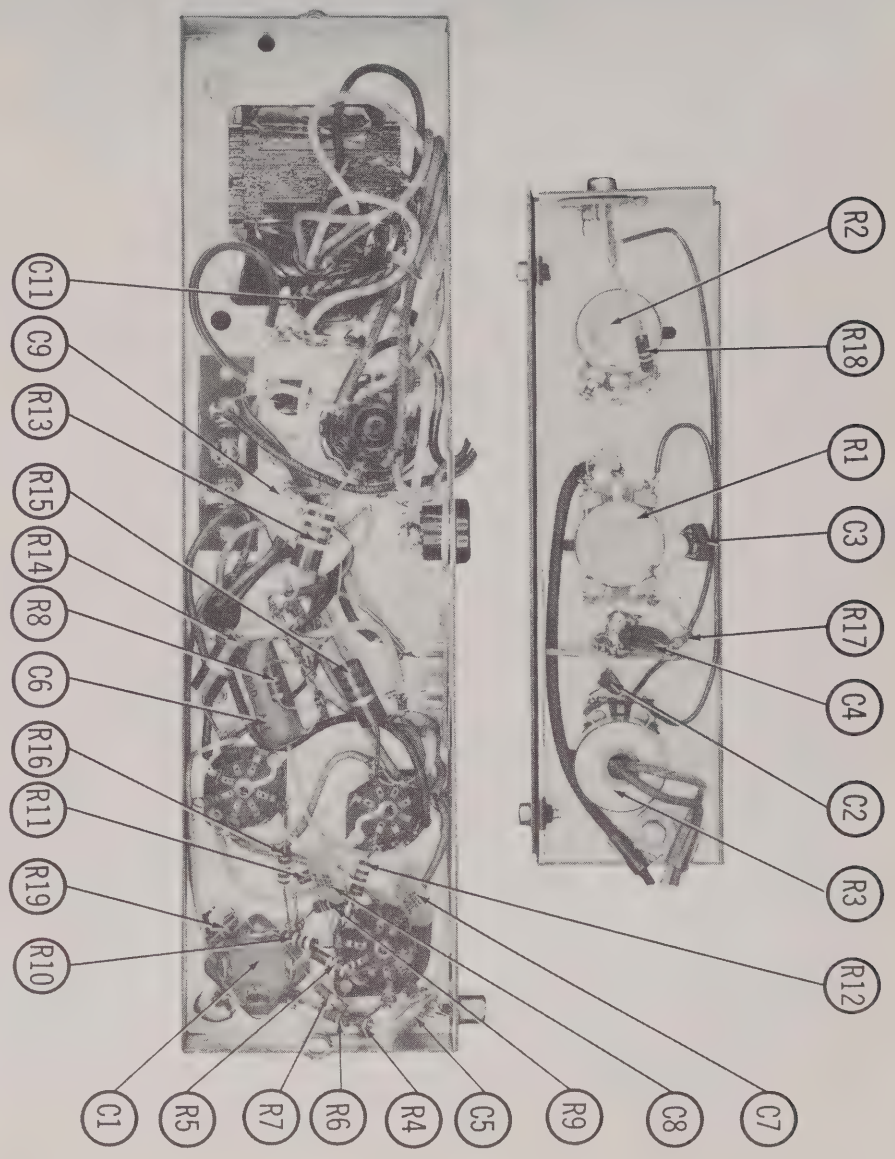
MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M3	Pilot Lamp		#1847

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW

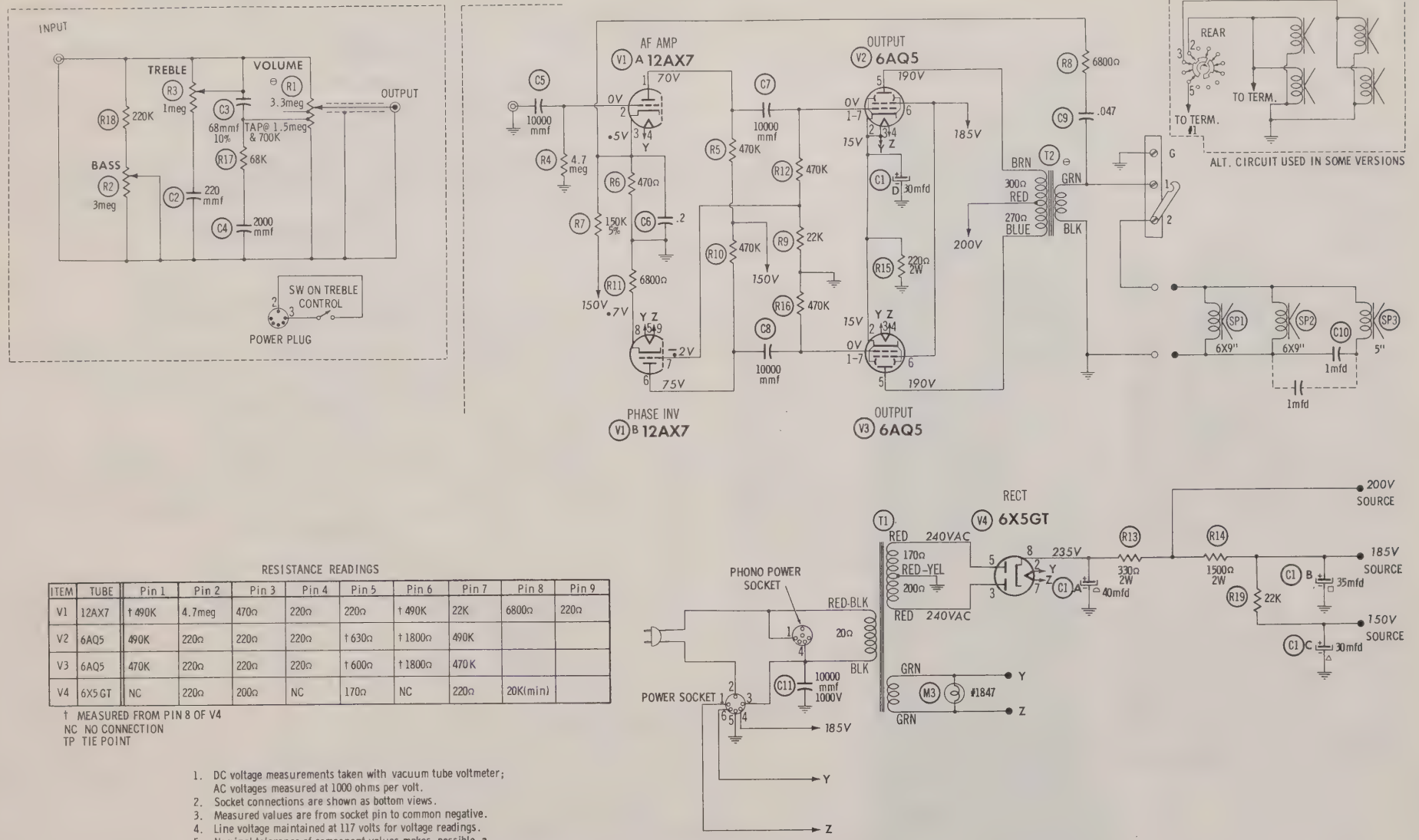


SET 387 FOLDER 10

FOLDER 10

MAGNAVOX CHASSIS AMP-157AA

MAGNAVOX CHASSIS AMP-157AA



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†490K	4.7meg	470Ω	220Ω	220Ω	†490K	22K	6800Ω	220Ω
V2	6AQ5	490K	220Ω	220Ω	220Ω	†630Ω	†1800Ω	490K		
V3	6AQ5	470K	220Ω	220Ω	220Ω	†600Ω	†1800Ω	470K		
V4	6X5GT	NC	220Ω	200Ω	NC	170Ω	NC	220Ω	20K(min)	

† MEASURED FROM PIN 8 OF V4
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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L. F. BLANKENSHIP
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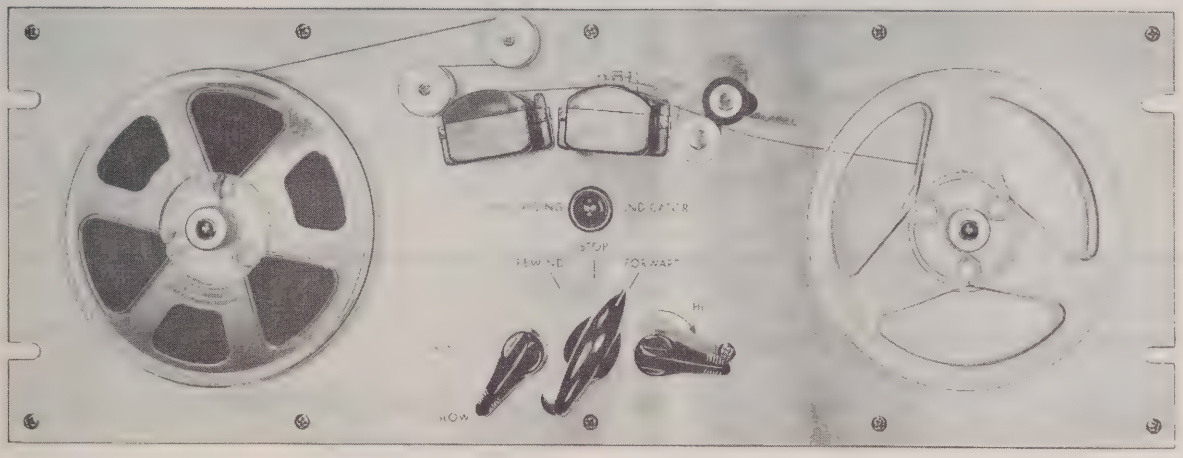
DENVER, COLORADO



MAGNECORD MODELS
PT6-J, PT6-6J, PT6-6A

MAGNECORD MODELS
PT6-J, PT6-6J, PT6-6A

GENERAL INFORMATION

The "Magnecord" Model PT6-6A Tape Recorder is designed for use with the "Magnecord" Amplifier Model PT6-6J.

The "Magnecord" Model PT6-6A Tape Recorder features Stop, Forward, Rewind, Play, and Record modes of operation merely by turning a knob. Any size reel up to 7 inches can be used. New recordings can be made on previously recorded tape since the erase head is automatically connected when the "Record" button is pressed or the same recording may be played back indefinitely.

Two sets of capstan-pressure roller combinations are furnished with each unit; the large capstan and small pressure roller provide for 15" per second tape speed and the small capstan and large pressure roller for 7 1/2" per second tape speed, using the standard 1800 r.p.m. motor.

Magnecord Division
Midwestern Instruments Inc.
41st. Street and Sheridan Road
Tulsa, Oklahoma

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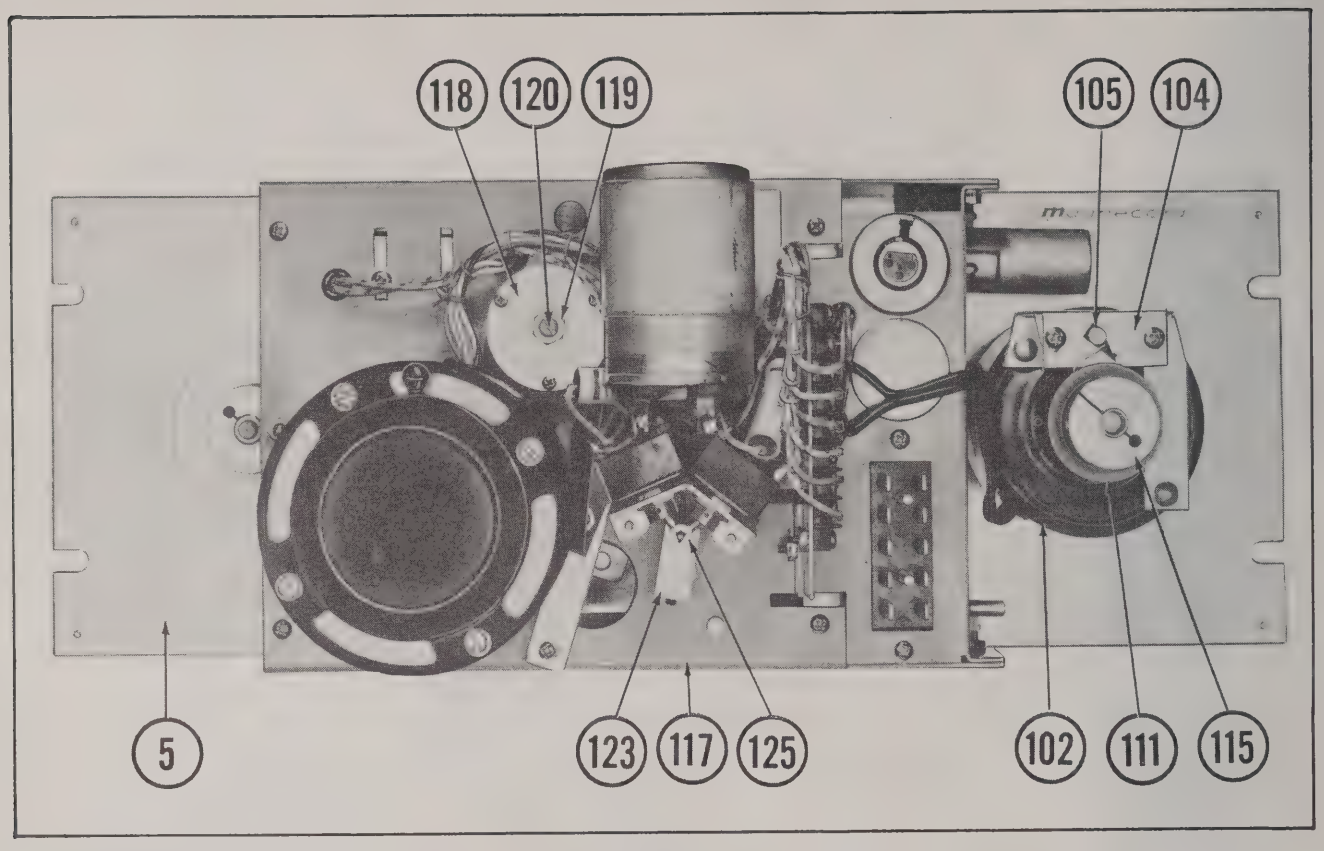

FIGURE 1

SPECIFICATIONS PT6-6A TAPE TRANSPORT

Recording Speeds: 7 1/2" per second, or 15" per second, interchangeable with no tools required.

Rewind Speed: 1200ft. of tape (full 7-inch reel) rewound in 40 seconds.

Flutter: Less than 0.3%

Frequency Response: At 7 1/2" per second 50 to 7500 cps or 40 to 15,000 cps with a tape speed of 15" per second.

Tube: Bias Oscillator tube 12AU7

SPECIFICATIONS PT6-J OR PT6-6J AMPLIFIER

Frequency Response: 50 to 15KC± 2 db equalized for 7 1/2" or 15" per second tape speed.

Input Level: Sensitivity-105 dbm for zero level recording. Maximum level-35dbm.

Input Impedance: 50 or 250 ohm, balanced or unbalanced. High impedance unbalanced bridge (phone Jack).

Noise: 60 millivolts maximum, at 600 ohm output (switch at "amp") 20 millivolts maximum, at 600 ohm output (switch at "listen") S/N ratio for "O" level Rec-PB-50db.

Tonal Harmonic Distortion: Less then 2% with 10 watts output.

Output Impedance: 600 ohms balanced, 16 and 4 ohms.

Output: 10 watts at 2% distortion.

Tubes: (1) type 5879
(1) type 12SJ7
(1) type 6SL7
(2) type 5881
(1) type 5Y3

Dimensions: Amplifier-8" deep, 7" high, 17" wide without carrying case. 13" deep, 8" high, 18" wide with carrying case.

Mechanical Unit: 11" deep, 7" high, 17" wide without carrying case. 16" deep, 8" high, 18" wide with carrying case.

Weight: Amplifier-16 lbs. without carrying case, 21 lbs. with carrying case.

INSTALLATION

Four knurled-head screws in the corners of the front panel of the PT6-6A mount it in its portable case or the Magnecorder rack amplifier or rack panels designed for use with the units.

OPERATING INSTRUCTIONS

The PT6-6A motors and oscillator tube receive their power through the male Jones connector on the rear of the unit. See schematic for terminal disignation. Motor operating power, oscillator filament power and plate supply voltage are supplied by the Magnecorder PT6-6J amplifiers. The female Cannon connector on the rear of the PT6-6A is connected to the record reproduce head. See Schematic.

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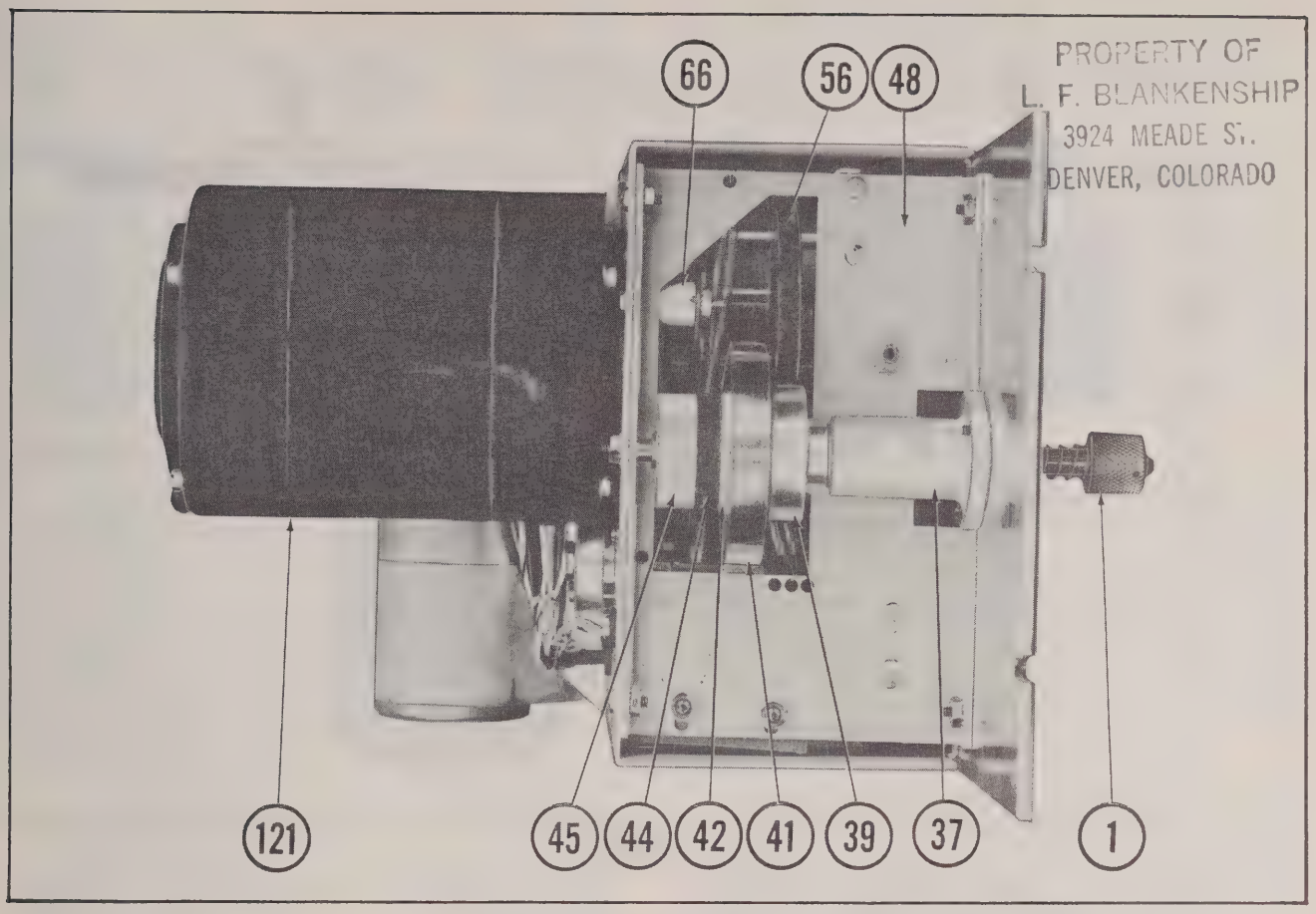

FIGURE 2

1. Make sure the oscillator tube located in the rear and at the right side is secure in its socket.

2. Set the control knob (30) to stop.

3. Make sure the correct capstan and pressure roller are in place and that the knurled retaining screws are screwed down firmly. The small (7 1/ 2" per second) capstan operates with the large rubber covered pressure roller. Make sure that the tapered shaped capstan shaft are completely free of dirty or foreign particles before installing capstan.

Threading The Tape

1. Before a reel of tape can be placed on the spindle, reel retaining knob (1) must be removed. To remove the reel knob, push it in and turn counter-clockwise to release the bayonet pin.

2. Place the empty reel on the take-up spindle (36), and replace the reel retaining knob (1).

3. Place a reel of tape on the rewind spindle (2), and replace the reel retaining knob (1).

4. Pull off about 2ft. of tape, thread over and around the top tape guide roller (23), then around the lower tape guide roller (9), over the erase head (15), and the record playback head (29), between the capstan (33) and pressure roller (35) and then thread on the right hand empty reel.

To Make A Recording

1. Turn power switch, on amplifier being used, to "On". This provides the necessary power for both amplifier and recorder mechanism.

2. Turn selector switch on the amplifier to the "Record" position.

3. Push the VU meter switch in to connect meter, if the PT6-6J amplifier is used in conjuction with the PT6-6A tape transport mechanism.

4. For headphone monitoring, insert plug of phones in the amplifier front panel Monitor Jack. For speaker monitoring, turn speaker volume control up to desired position.

5. Vary the volume level with the Gain Control. Turning the control clockwise increases the amplifier gain. The VU meter should move with the program material and should read a peak value of "O" once every few seconds to a minute depending upon the nature of the program being recorded.

6. To place tape transport mechanism in the "Record" position, de-press saftey button (19) and simultaneously, turn control knob (30) to "Forward". This sets the tape in motion.

7. The red bias indicator will glow when the oscillator is operating properly. This indicates a new recording is being made and any previous recording on the tape will be erased.

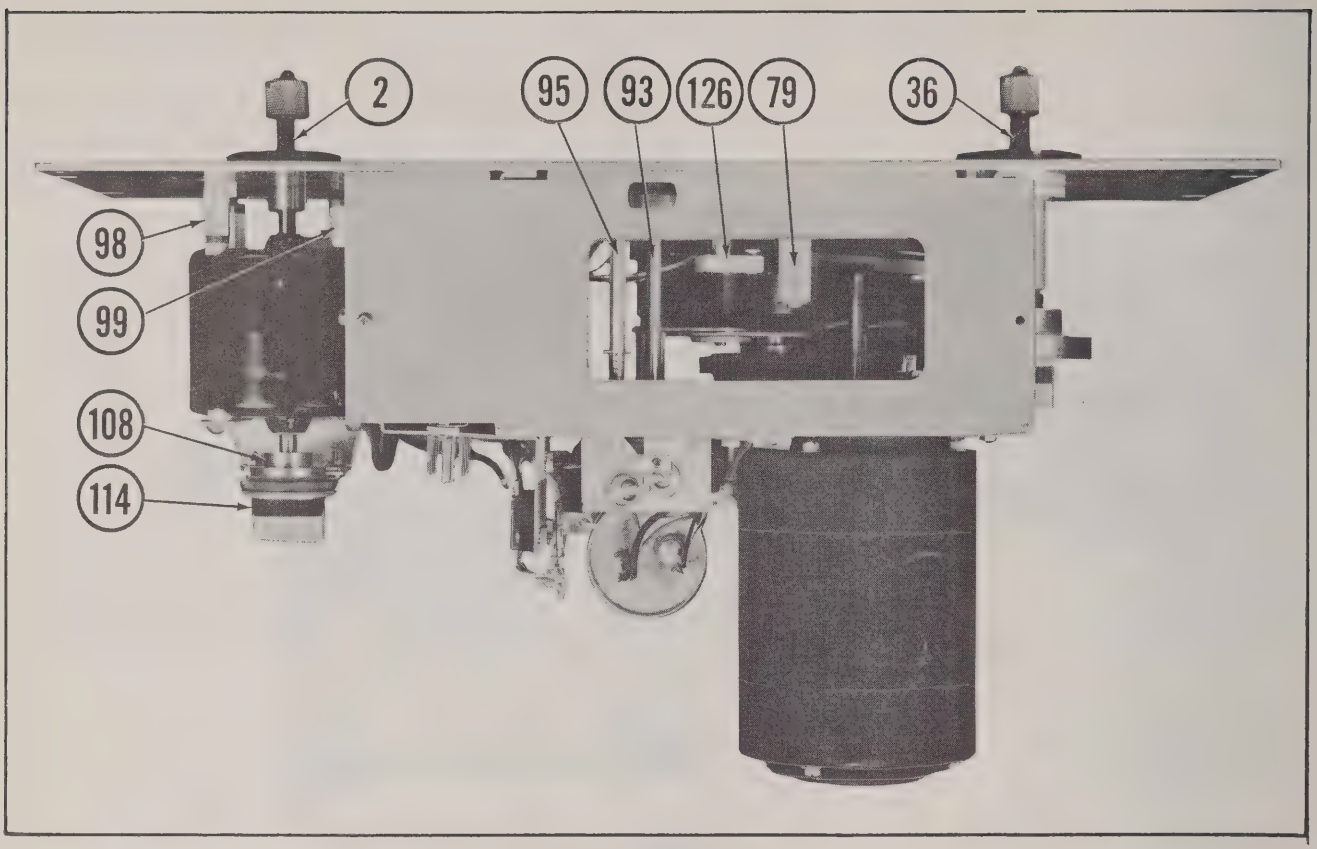

FIGURE 3

8. When the recording is completed, turn control knob (30) to " Stop".

To Rewind A Tape

1. To rewind the tape, turn the control knob (30) to "Stop", then place tape over lift bar (18) so that the tape is lifted clear of the heads. Turn the control knob to "Rewind". The rewind mechanism driven by a shaded pole motor (102), will completely rewind 1200 ft. of tape (full 7 1/2" reel) in approximately 40 seconds.

2. The control knob (30) may be turned to "Stop" at anytime during rewind without danger of tape being spilled.

3. Be sure that the tape is lowered to its normal position on the heads before attempting to record or reproduce.

Caution: When switching from "Rewind" to "Forward", always pause in the "Stop" position long enough for the tape to come to a complete stop. Failure to do so will result in tape breakage due to the tight grip the capstan and pressure roller exert on the tape when control knob (30) is in "Forward" position.

To Playback A Tape

1. Make interconnections as described under (Preparing The PT6-6A For Operation).

2. Set the selector switch on the amplifier (PT6-6J amplifier) to the "Listen" position.

3. Turn speaker volume control clockwise; pull the meter switch out for "Off" if volume level on playback makes it necessary to prevent meter damage.

4. De-press safety button (19) and place control knob (30) in "Forward" position.

Hi-Speed Forward

The "Hi-Speed Forward" control is the knob on the right side of the front panel. This control will only function when Main Control Knob is in the "Stop" position. To place machine in "Hi-Speed Forward", turn control to the right and hold. To stop machine, release control.

If you have rewound the tape to far, turn the Hi-Speed Forward knob which will reel the tape rapidly forward until the beginning of the recording is reached.

Recording Indicator

The Recording Indicator lamp will glow when plate supply voltage is being supplied to the oscillator tube. This indicates that any previous recording on the tape is being erased and a new recording may be made.

MECHANICAL OPERATION

Flywheel And Capstan

The balanced flywheel and capstan (83), which is driven by two rubber-tired wheels (67 and 70), provide a constant speed for the tape.

Pressure Roller

The pressure roller (35), which is actuated by control knob (30) through the media of switch control

shaft (94) and pressure roller pivot bracket (79), keeps a positive pressure against the tape and capstan to aid in maintaining the constant rate of tape travel.

Hi-Speed Forward

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The Hi-Speed Forward is put into operation by pressing the Hi-Speed Forward control knob (128), which in turn, actuates control shaft and wire (126), pivot arm wire (53), and the fast forward wheel mounting bracket (50). This pulls the fast forward wheel (56) into contact with the motor drive shaft and the take-up hub (39). Simultaneously, pivot arm (53) moves against the fast forward actuating switch, starting the main drive motor (121).

Rewind System

When control knob (30) is placed in "Rewind", switch (125) is actuated starting the rewind motor (102). A DC operated selenoid is also energized during rewind, which pulls the forward idler wheel (61) away from the take-up hub (41), allowing the bearing mounted take-up shaft (36) to turn freely. When the rewind operation is completed, and control knob (30) is returned to the "Stop" position, the selenoid is de-energized. This allows the forward idler wheel (61) to contact the take-up hub (41) applying a braking force sufficient to stop the reel.

The "one-way" pawl actuated clutch on the rear shaft extension of the rewind motor (102), operates in such a manner so that as the tape is unwound from the rewind spindle (2), a certain amount of drag is imparted to the motor shaft which is then transmitted to the tape as tension. When rewinding, the pawl is desengaged from the ratchet disc (111) by the direction sensitive rewind pawl spring (110) which allows the motor shaft to turn freely. A rapid rewind results.

Take-Up System

The take-up system is driven by the main drive motor (121) through two rubber-tired idler wheels (67 and 70), which are mounted on sliding suspension arm supports (82 and 87). Idler wheels (67 and 70) are held in contact with the hub of the flywheel (83) and the forward motor shaft (121) by action of springs (71). This, in turn, drives the capstan (33), which is secured to the flywheel shaft and, with the use of pinch roller (35), conveys the tape at a constant rate of speed.

The take-up shaft (36) is driven by the forward idler wheel (61), which makes contact with the forward motor shaft and the take-up hub (41). The take-up hub (41) is concentrically mounted on the take-up shaft (36) and is coupled to the shaft through a slipping assembly (30 thru 46) similar to that employed in the rewind system. With tape properly threaded on the recorder and the mechanism in "Forward", the take-up shaft (36) slips a certain amount due to the pressure applied on the tape by the slower running capstan and pressure roller. Consequently, the tension imparted to the tape causes the tape to move from one reel to the other without throwing or stalling.

ADJUSTMENTS

Head Alignment

1. The primary purpose in head alignment is to provide the maximum frequency response. For this purpose it is not necessary to adjust the erase head.

Note: Before attempting to align the record-reproduce head make certain that the difficulty is not due to an accumulation of tape coating residue on the pole surfaces.

2. The right mounting screw of the record-reproduce head is drawn up securely. This side of the head holder is provided with a rocker action. The left adjustment screw (14) is associated with a compression spring. Rotating this screw changes the gap alignment with respect to the tape. Proper alignment is achieved when the maximum signal, at a given setting of the gain control is reproduced from the alignment tape, as the alignment screw (14) is turned in or out.

Solenoid Adjustments

Solenoid (72) which is energized during rewind, should pull against springs (64) and lift idler wheel (61) away from the drive motor shaft by 1/16", but maintain contact between idler wheel (61) and the take-up shaft. When the mechanism is switched from "Rewind" to "Stop" the solenoid relaxes, spring (64) returns idler wheel (61) into contact with the drive motor shaft. This shaft is not turning and in turn, idler wheel (61) is prevented from turning and thus stops the free rotation of Take-up Wheel (41) which acts as a brake on the take-up shaft.

Selenoid (72) should be positioned so as to accomplish the above results. The solenoid is mounted by means of two screws in slotted holds in the back panel above the drive motor (121). Care should be taken that, when readjusting the solenoid, the plunger does not bind within the tube. To check this, place the recorder with its panel horizontal (reel shafts vertical) and operate the control knob (with power applied to mechanism) between "Rewind" and "Stop". Return springs (64) should have enough tension to return idler wheel (61) to its normal position when there is no binding of the solenoid plunger.

Clutch Adjustments

Tape tension is maintained by two friction clutches. Their correct adjustment causes the tape to move from one reel to the other in either direction without throwing tape or stalling.

1. The clutches are located on the rear ends of the supply reel spindle (2) and the take-up reel spindle (36). The supply reel spindle clutch is located at the right side (facing the rear of the unit) and consists of an oiled felt washer (112) pressing against a knurled disc (111) which is free to rotate in a clockwise direction but prevented from turning in the opposite direction by a spring loaded pawl (105). Pressing against the opposite side of the felt washer is a sponge rubber washer (14). A split, knurled adjustment ring (115) bears against the sponge rubber washer (114) and is loaded in place by means of a set screw (116). The set screw must be backed off before the adjusting ring (115) can be turned. Rotating the adjustment ring clockwise increases the clutch friction.

2. The supply reel spindle clutch adjustment should maintain a drag as the supply reel rotates when the recorder is in "Forward" operation. This drag should be sufficient to stop the supply reel without permitting the tape to loop, or to be

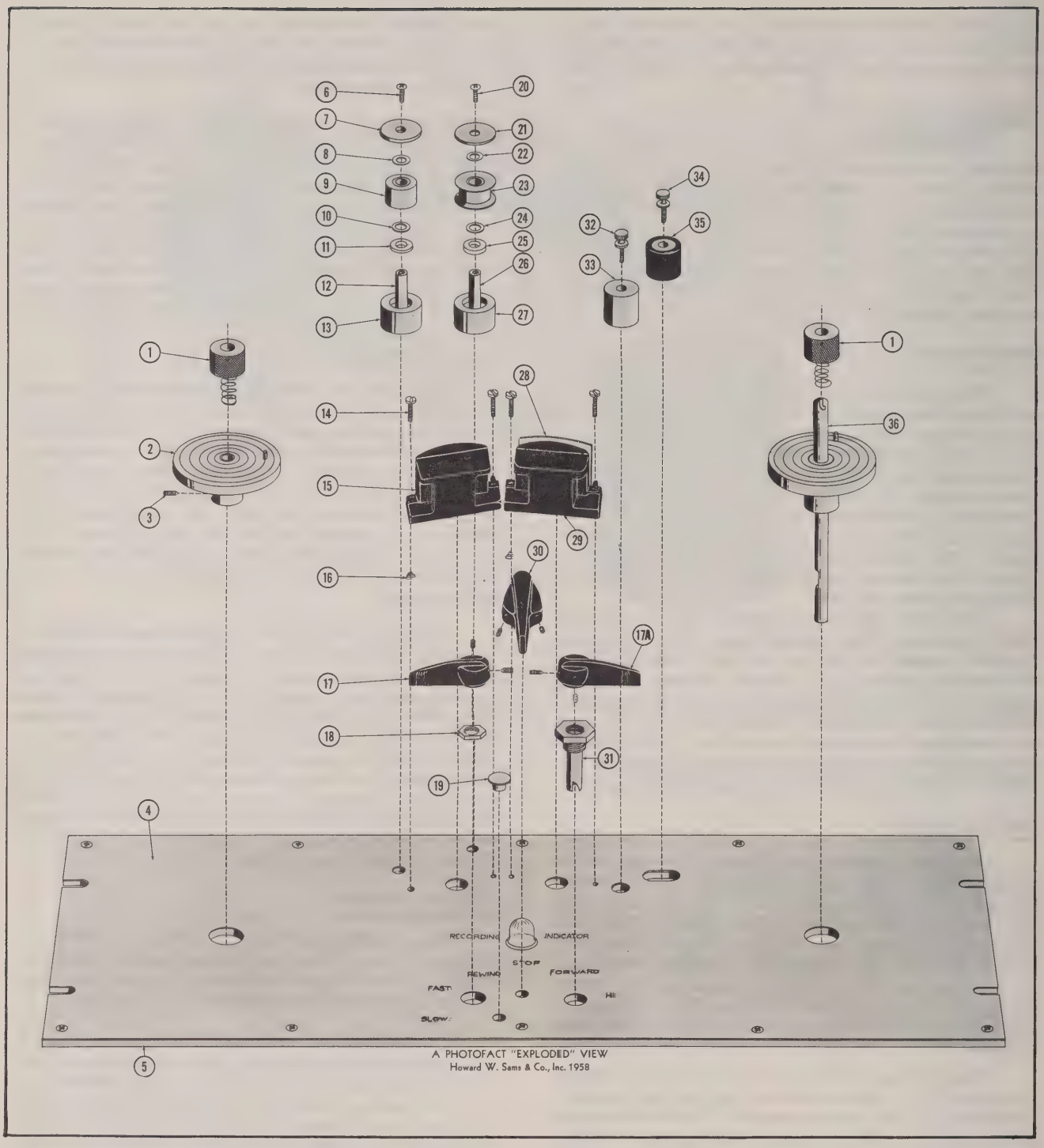

FIGURE 4A. EXPLODED VIEW OF PARTS ABOVE FRONT PANEL

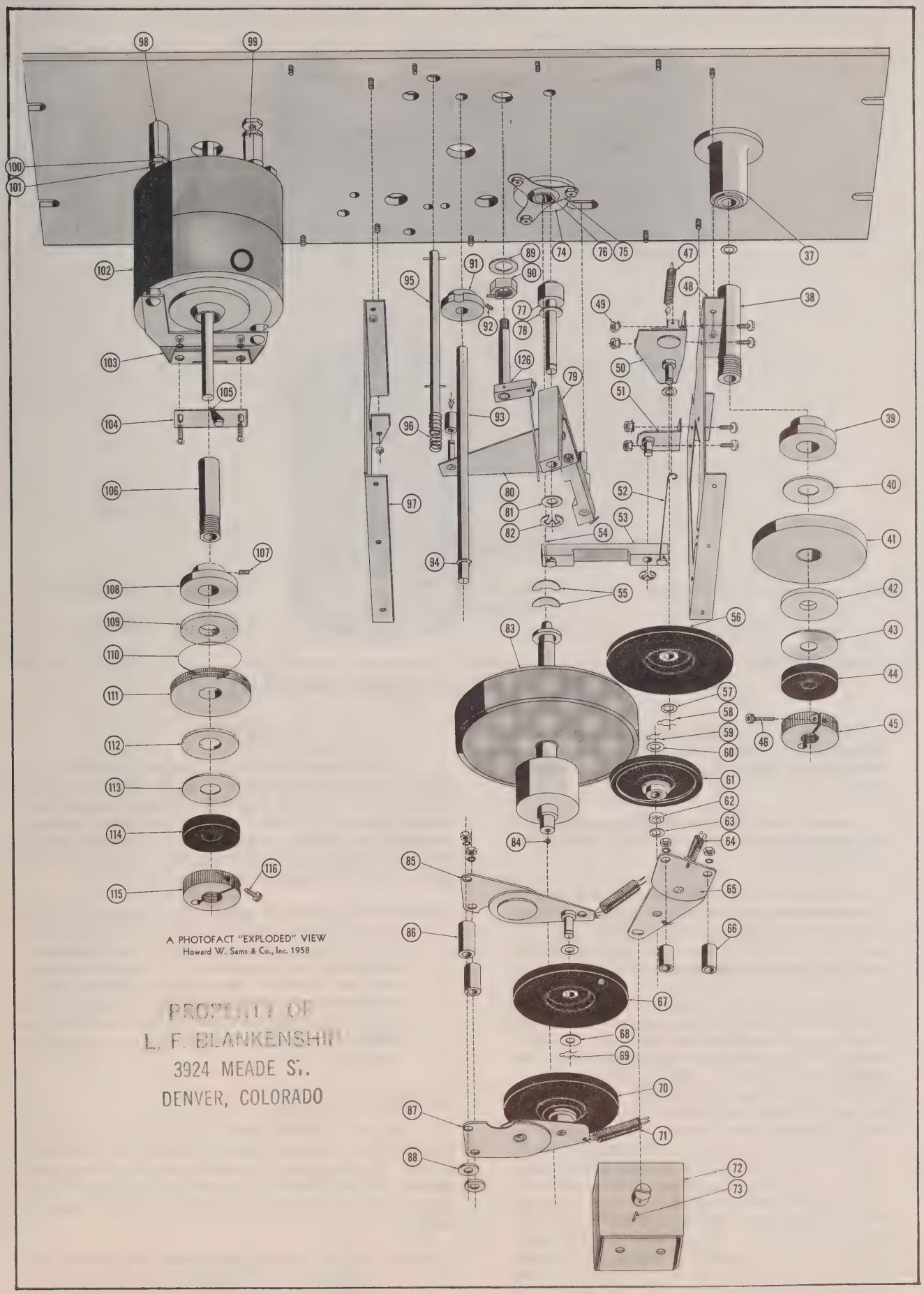

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FIGURE 4B. EXPLODED VIEW OF PARTS BELOW FRONT PANEL

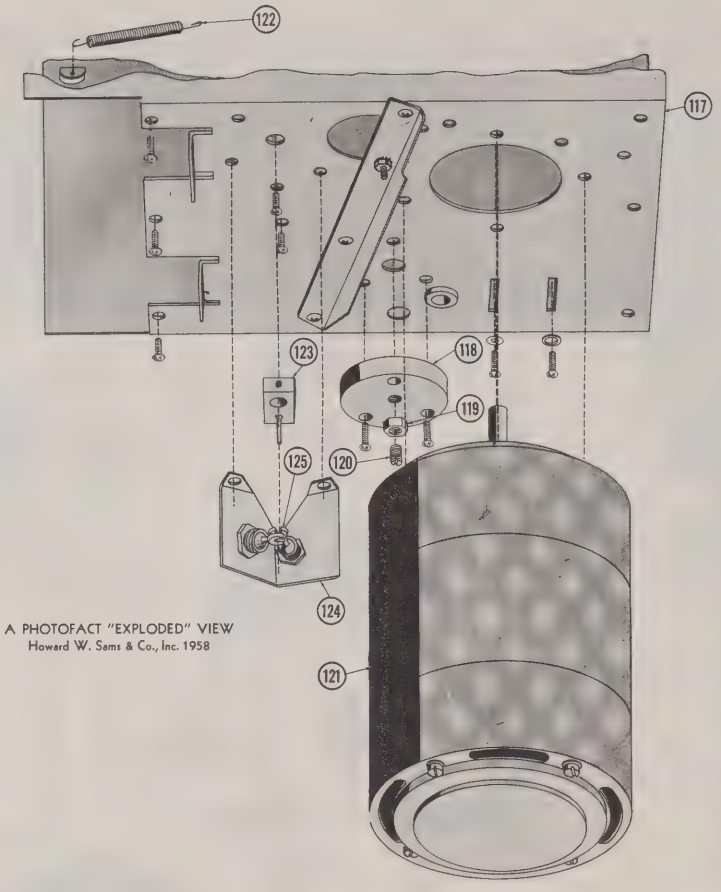


FIGURE 4C. EXPLODED VIEW OF PARTS BELOW BACK PANEL

thrown when control knob switch is turned from "Forward" to "Stop". The amount of friction should be the minimum necessary to accomplish this.

3. To much clutch friction will increase the tape drag to a point at which the tape speed will be below normal.

4. The take-up reel (36) friction clutch is located on the left side (facing the rear). This is similar in appearance to the other clutch but employs no pawl. It is also necessary to back off the set screw (46) before adjusting this clutch.

5. The take-up reel spindle friction clutch couples the spindle to the synchronous drive motor, when the control knob is set to "Forward" and acts as a brake on the take-up reel when the control knob is set to "Stop". The clutch adjustment should provide sufficient friction for the take-up reel and capstan (33) to move the tape at normal speed forward when the take-up reel is almost completely full and the supply reel nearly empty. It should also provide sufficient braking to maintain tape tension and prohibit tape throw when the control switch is turned to "Stop", after the take-up reel has been rotating at high speed during rewind. The split knurled ring (45) should be adjusted to provide the minimum clutch friction to accomplish these two functions. About 5 inch oz. for each clutch is correct friction.

CLEANING

It is necessary that the portions of the erase and the record-reproduce head which comes into contact with the tape be kept free of dust, grease and foreign matter, or the frequency response characteristics will suffer. They should be cleaned with a soft cloth slightly moistened with carbon tetrachloride after every five hours of operation.

Note: Do not attempt to apply carbon tetrachloride to any part of the recorder when loaded reels are in place as the tape is soluble in carbon tetrachloride and will be ruined if it comes in contact with the solution. After using carbon tetrachloride make sure the heads are completely dry before threading tape and be sure none of the solution is transferred to the tape from the fingers.

Oiling The Clutch Felts

The felt washers have been oil treated at the factory to provide the correct amount of slippage. It may be necessary to give each felt washer supply spindle (2) and take-up spindle (36) one drop of high quality sewing machine oil after several months of use.

Caution: Do not over-oil the clutch felts as this may cause oil to be thrown on nearby idlers causing slippage in the drive system. One drop per felt is sufficient.

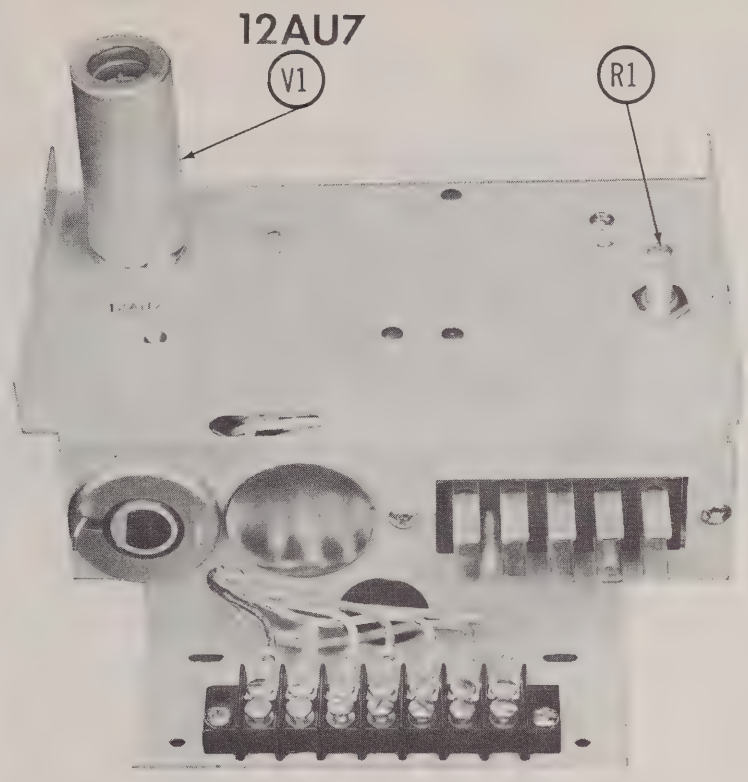
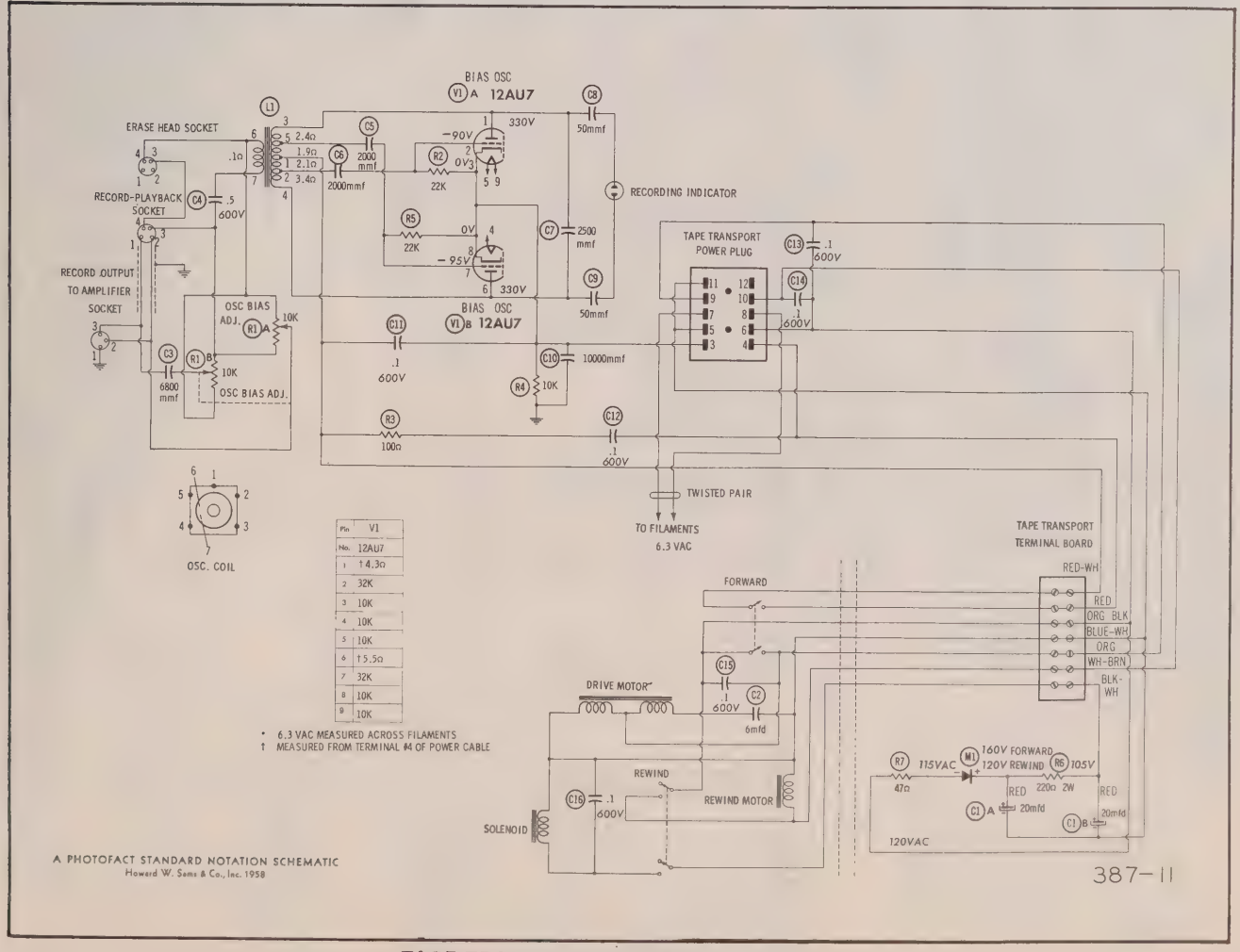


FIGURE 5



TAPE TRANSPORT SCHEMATIC PT6-6A

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Bias Osc.	12AU7	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNECORD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	20	150	23X10	PRS150V2020	BBRD2215	TCD45	TDLD-3	FMD-1520	TVA-2428
B	20	150							
C2	6	220 VAC		RR-644	CRX3050	RP-3306		MT-3512 † MT-3512 †	OP1507

† Connect negative leads together.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNECORD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	6800		21X21	1467-0068	DD-682	1D5D68	CY30C682K		1FM-268	
C4	.5	600	26X8							
C5	2000		21X6	1467-002	DD-202	1W5D2	CY20C202K	MC457	1FM-22	
C6	2000		21X6	1467-002	DD-202	1W5D2	CY20C202K	MC457	1FM-22	
C7	2500		21X1	1467-0025	DD-252	1W5D25	ED-0025	MC460	1FM-225	
C8	50		21X4	1468-00005	DD-500	5W5Q5	CY10C500J	MC225	1FM-45	
C9	50		21X4	1468-00005	DD-500	5W5Q5	CY10C500J	MC225	1FM-45	
C10	10000		21X6	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C12	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C13	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C14	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C15	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C16	.1	600	28X2	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNECORD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	10K		14X32			Q11-116		Osc. Bias Adjustment.
R1B	10K					M11-116		Osc. Bias Adjustment.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNECORD PART No.	NOTES
	OHMS	WATT		
R2	22K		11X10	
R3	100Ω		11X14	
R4	10K		11X2	

ITEM No.	RATING		MAGNECORD PART No.	NOTES
	OHMS	WATT		
R5	22K		11X10	
R6	220Ω	2	11X129	
R7	47Ω		11X21	

COILS

ITEM No.	USE	REPLACEMENT DATA					
		MAGNECORD PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Bias Osc.	91B7					

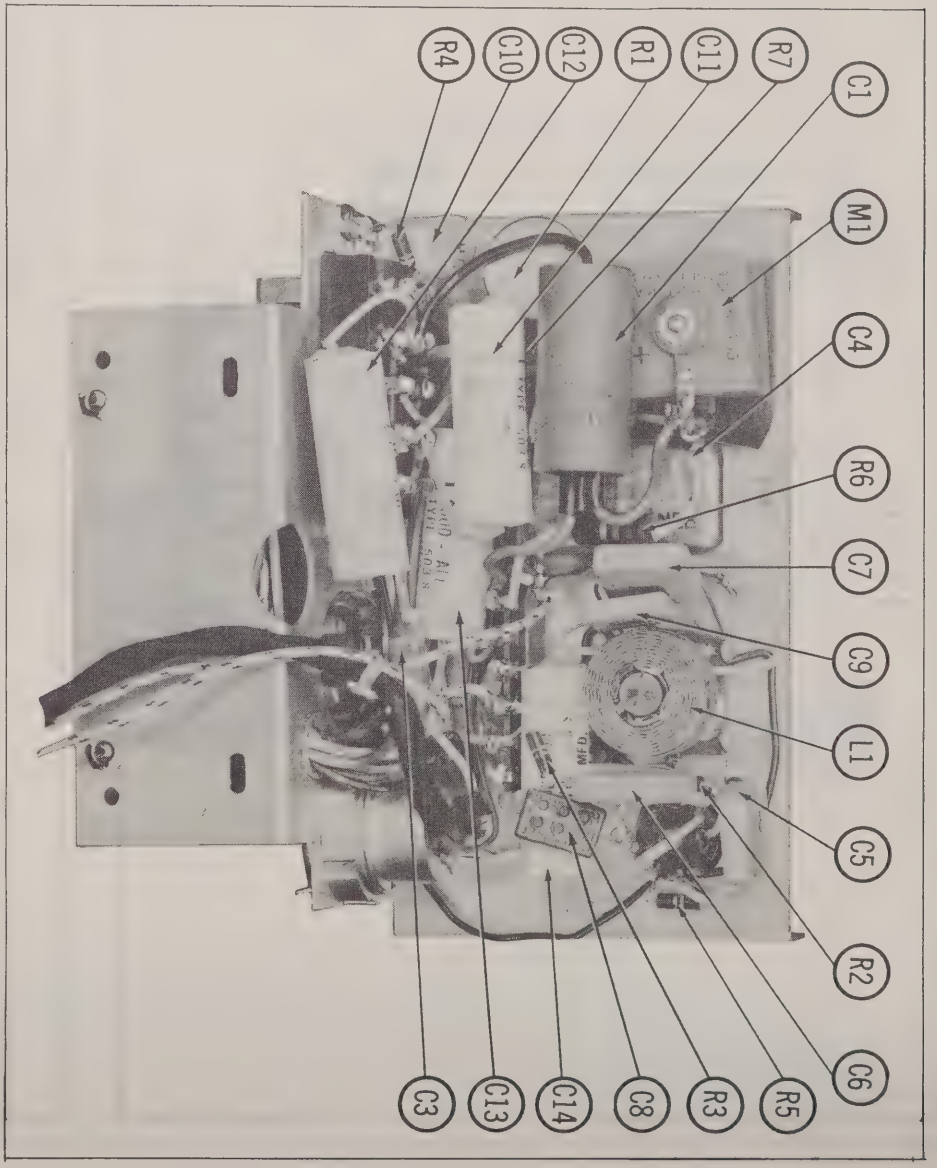
RECTIFIERS

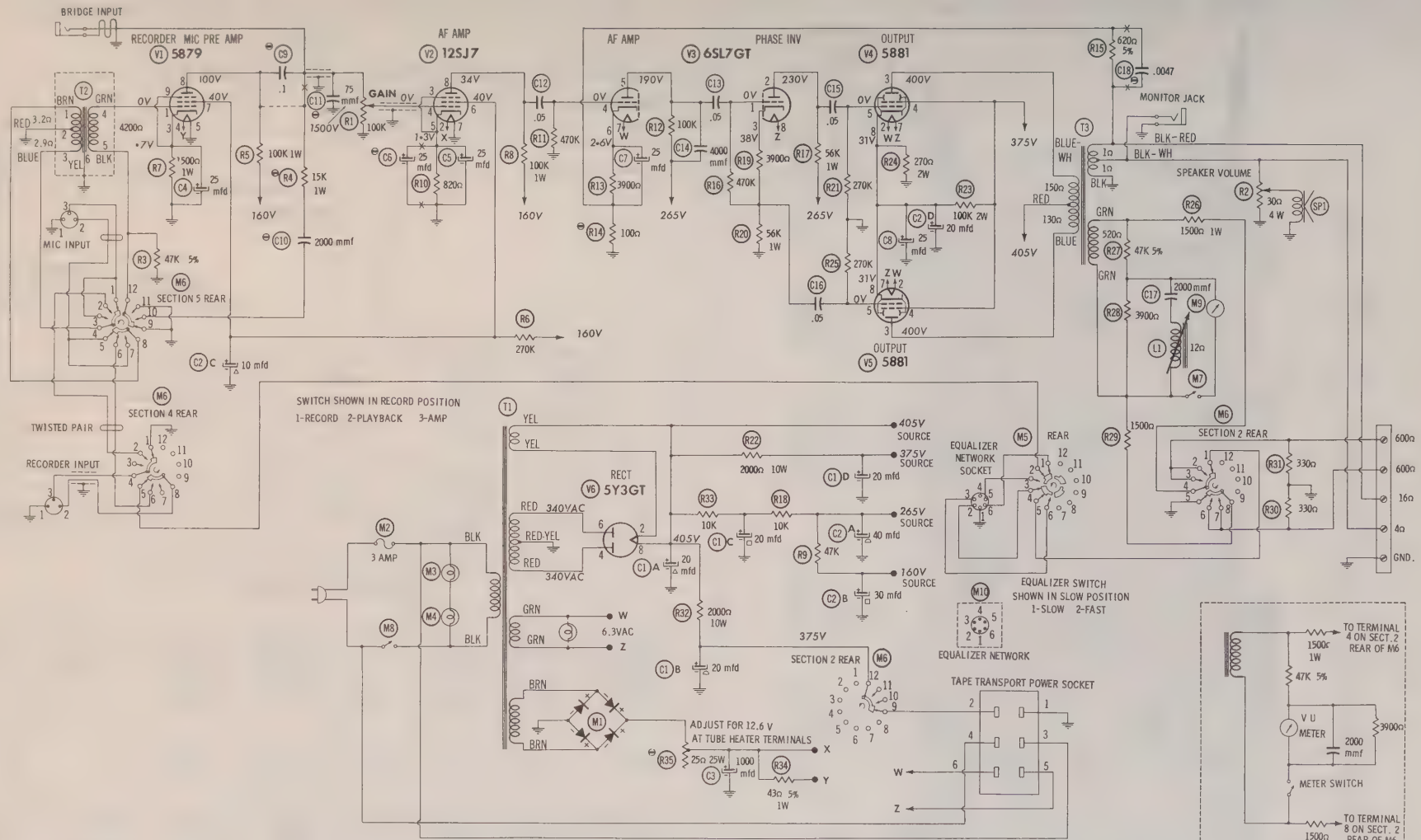
ITEM No.	RATING	REPLACEMENT DATA				
	CURRENT (Measured)	MAGNECORD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.068A	42A5 ①	1005A①	RS150 ①	150 ① M150②	① Selenium Type ② Silicon Type

CHASSIS—BOTTOM VIEW

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 9401





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5879	51K	0Ω	1500Ω	6Ω	0Ω	TP	†335K	†165K	1500Ω
V2	12SJ7	TP	0Ω	820Ω	0Ω	820Ω	†335K	.9Ω	†165K	
V3	6SL7	525K	†75K	60K	470K	†120K	4000Ω	0Ω	.1Ω	
V4	5881	TP	.1Ω	†150Ω	†2000Ω	270K	TP	0Ω	270Ω	
V5	5881	TP	0Ω	†130Ω	†2000Ω	270K	TP	.1Ω	270Ω	
V6	5Y3GT	0Ω	20K(min)	NC	80Ω	TP	77Ω	NC	20K(min)	

† MEASURED FROM PIN 8 OF V6
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

387-11

AMPLIFIER SCHEMATIC MODELS PT6-J, PT6-6J

MAGNECORD MODELS
PT6-J, PT6-6J, PT6-6A

FOLDER 11

PAGE 11

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Recorder-Mic Preamp.	5879	
V2	AF Amp.	12SJ7	
V3	AF Amp-Phase Inv.	6SL7GT	

ITEM No.	USE	TYPE	NOTES
V4	Output	5881	
V5	Output	5881	
V6	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MAGNECORD PART' No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450		AFH4-14	D'0130	FP444	TMQ-12	Q-040	TVL-4763
B	▲ 20	450							
C	■ 20	450							
D	20	450							
C2A	▲ 40	450		AFH4-78	D0640	FP429	TMQ-92	Q-380	TVL-4734
B	■ 30	450							
C	▲ 10	450							
D	20	25							
C3	1000	15		PRS15V1000	BR10001	TC1501	TD-1000-15	S-020	TVA-1163
C4	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C5	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C6	25	25	Note 1.	PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C7	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C8	25	25		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205

Note 1. Not Used In Some Versions

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

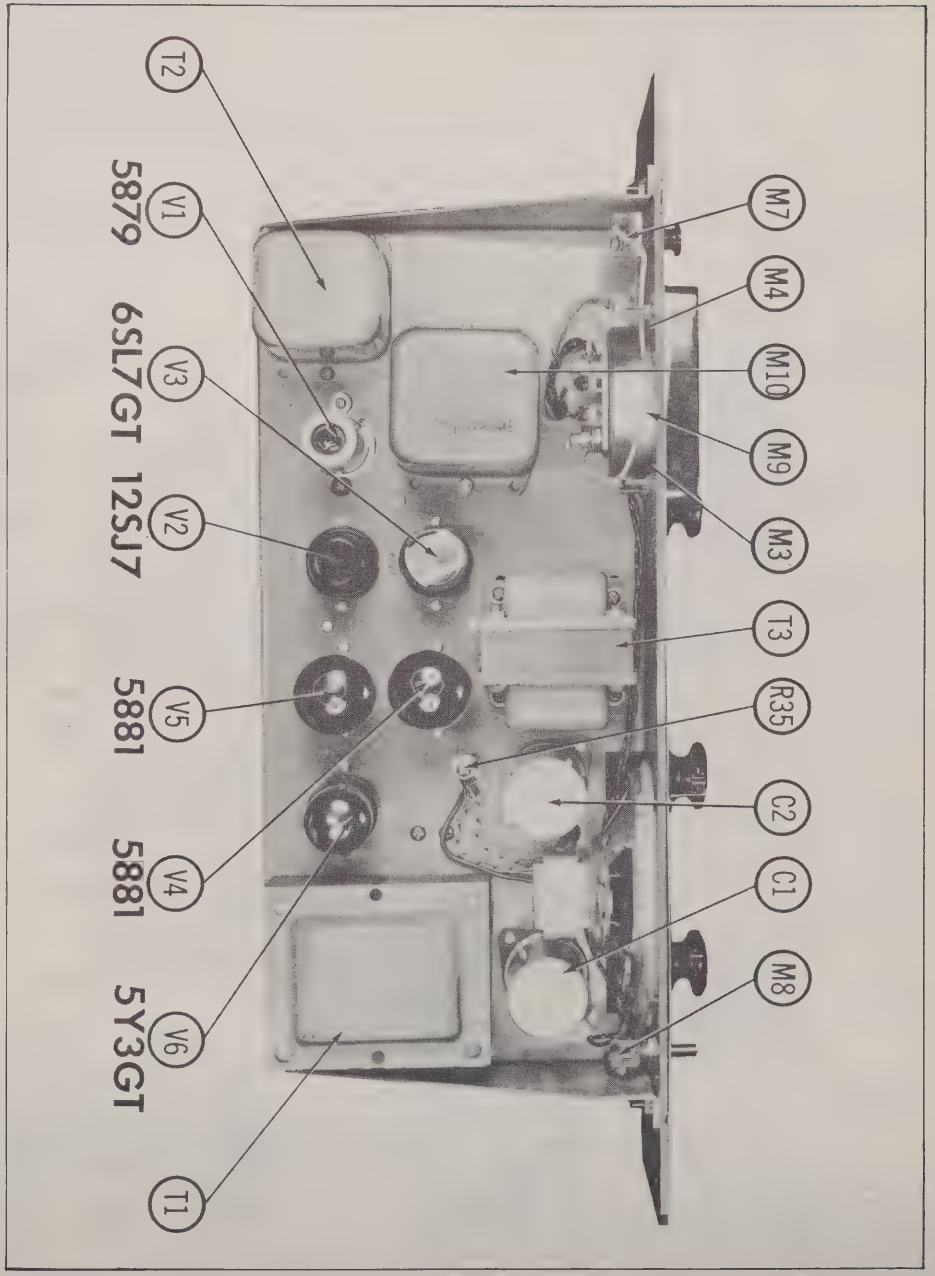
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNECORD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C9	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	①
C10	2000			1467-002	D6-202	1W5D2	ED-002	DC522	1FM-22	②③
C11	75	1500								
C12	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C13	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C14	4000			1467-004	D6-402	1W5D2	ED-004	MC463	1FM-24	
C15	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C16	.05	400		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C17	2000			1467-002	D6-202	1W5D2	ED-002	DC522	1FM-22	
C18	.0047	400		P488N-0047	DD-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	④

① Some versions use .05 mfd@ 400V in this application
② Some versions use 2500 mmf in this application
③ Some versions use 50 mmf in this application
④ Not used in some versions

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNECORD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	100K	½	14X21	B-41	A47-100K-Z	Q13-128	U39	Gain
B	Shaft			Not Req.	RS-3	Not Req.	Not Req.	
R2A	30Ω	4	14X6	WW-300	A10-30	WPK30	M30PK	Speaker Vol. Wire Wound
B	Shaft			Not Req.	RS-3	Not Req.	DS-36	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MAGNECROD PART No.	NOTES
R3	47K 5%			
R4	15K	1		Note 1
R5	100K	1		
R6	270K			
R7	1500Ω	1		
R8	100K	1		
R9	47K			
R10	820Ω			
R11	470K			
R12	100K			
R13	3900Ω			
R14	100Ω			Note 2
R15	620Ω 5%			
R16	470K			
R17	56K	1		
R18	10K			
R19	3900Ω			
R20	56K	1		
R21	270K			
R22	2000Ω	10		
R23	100K	2		
R24	270Ω	2		
R25	270K			
R26	1500Ω	1		
R27	47K 5%			
R28	3900Ω			
R29	1500Ω			
R30	330Ω			
R31	330Ω			
R32	2000Ω	10		
R33	10K			
R34	43Ω 5%	1		
R35	25Ω	25		Note 3

Note 1. Some versions use a 47K in this application
Note 2. Some versions use a 220Ω in this application
Note 3. Fixed resistor with adjustable tap to set 12.6 V on heater line.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MAGNECORD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Audio Choke					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA MAGNECORD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V .87A	700VCT @ .100A SEC 4 17V @ .300A	5V @ 2A	6.3V @ 2.4A	32B29					

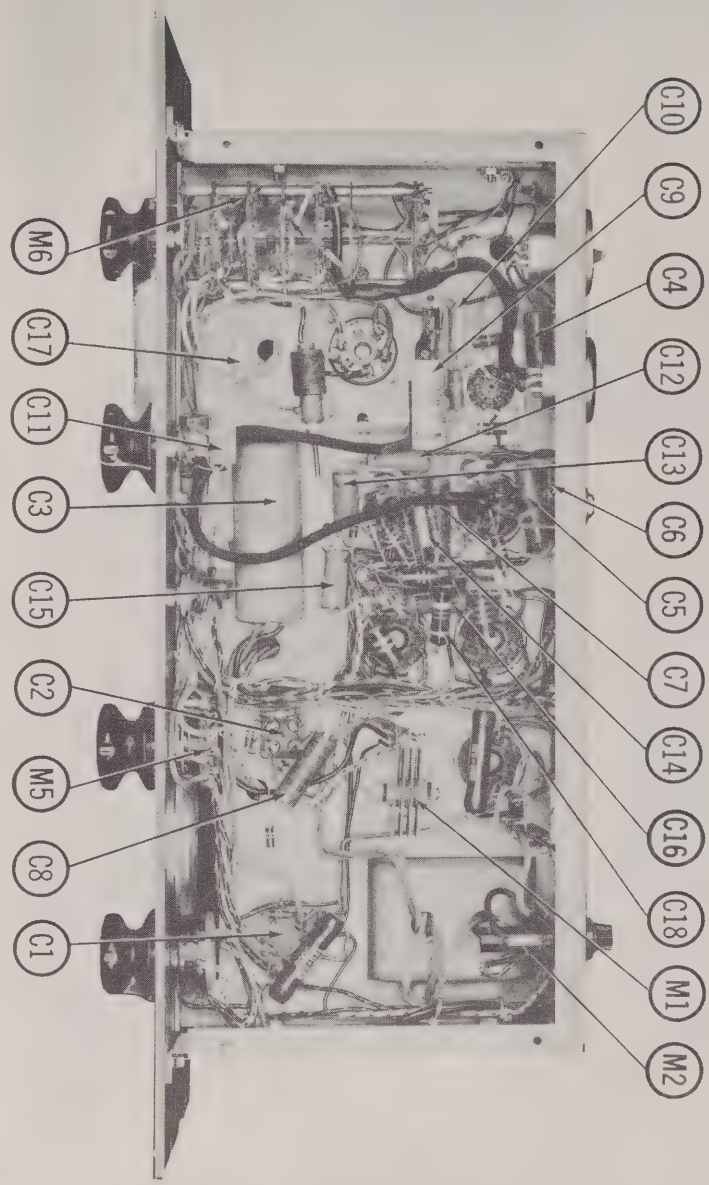
TRANSFORMER (INPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNECORD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	30:	1	32B1				25A08 ①		① Drill New Mounting Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MAGNECORD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	5500Ω CT	600Ω SEC 2 16Ω Tap @ 4Ω	32B30						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNECORD PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω		5A1	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	MAGNECORD PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.300		1016	B1B	604B	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MAGNECORD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 125V S/B			313003. (3AG 3A 125V S/B)	342001	MDX3	14KP

MISCELLANEOUS

ITEM No.	PART NAME	MEGNECORD PART No.	NOTES
M3	Pilot Lamp		VU Meter
M4	Pilot Lamp		VU Meter
M5	Switch		Equalizer, Rotary Wafer Type.
M6	Switch		Function, Rotary Wafer Type
M7	Switch		Meter, Leaf Type
M8	Switch		Power, On-Off, Leaf Type
M9	Meter		VU
M10	Network		Equalizing

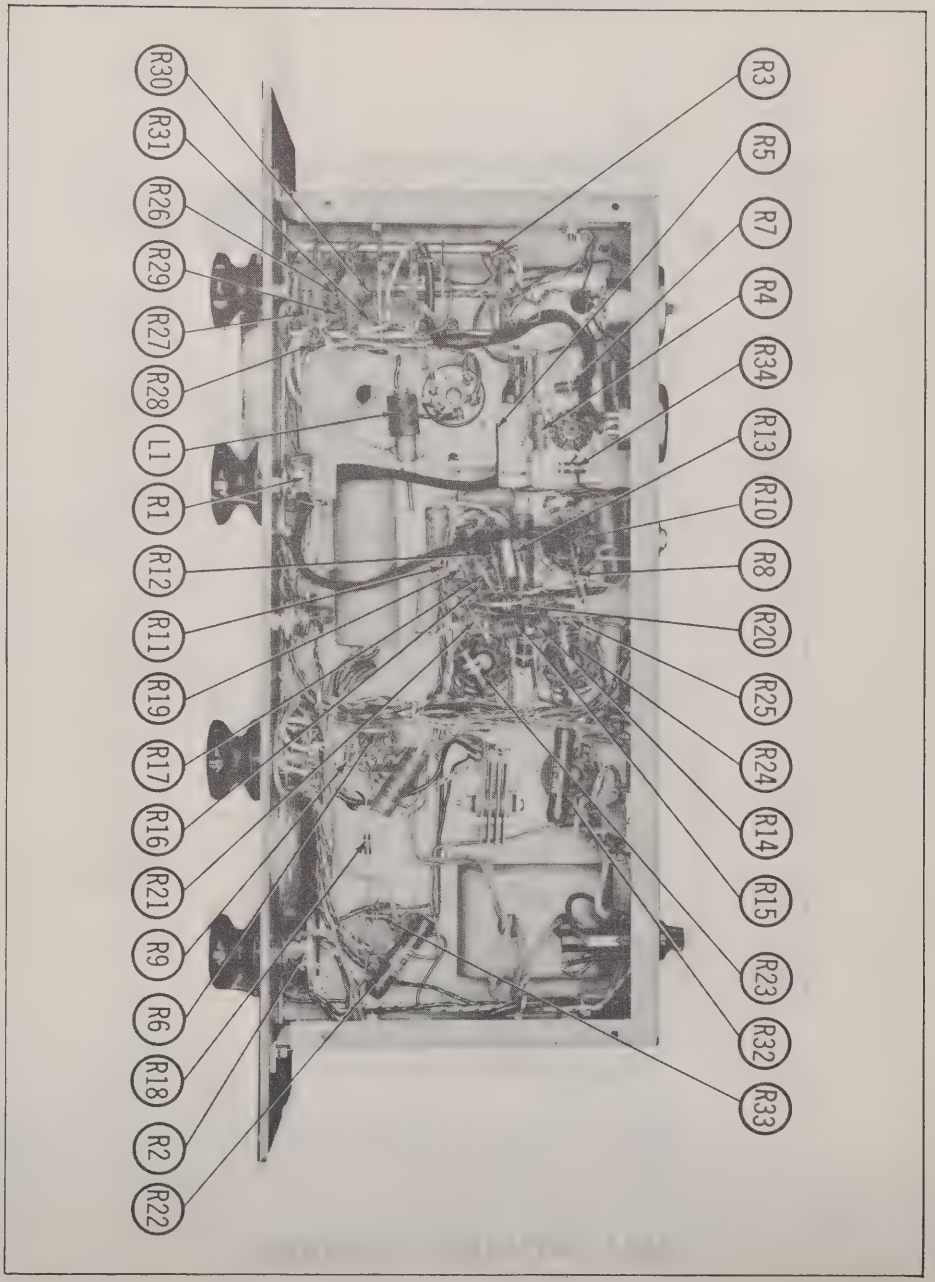
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401

CHASSIS—BOTTOM VIEW



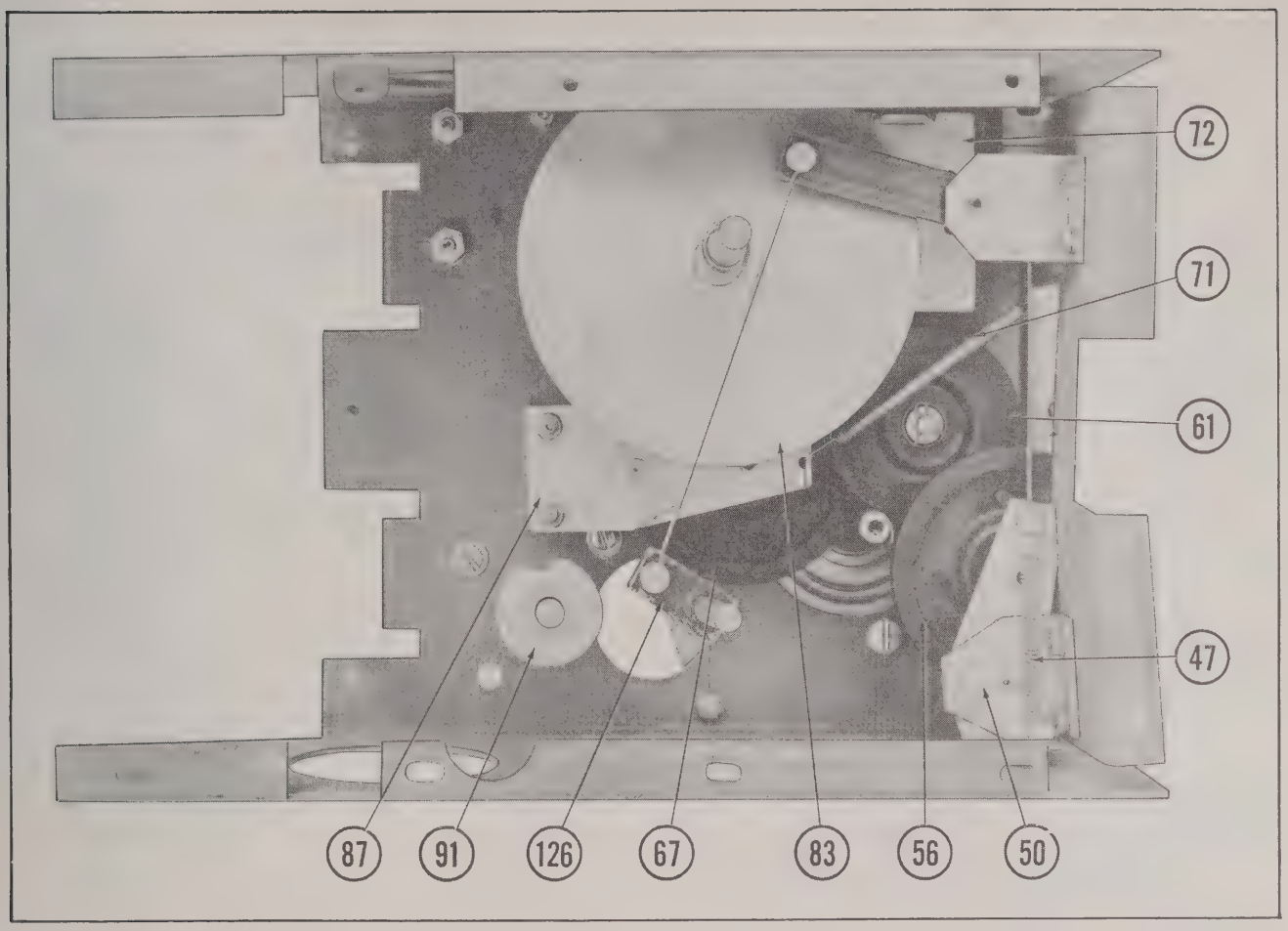


FIGURE 6

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	91A5	Reel Retainer (2)			O. D. x 1/16 Th.
2	91A82	Rewind Reel Flange Assembly	26	76A8	Guide Roller Shaft
3	61-8SS3	8 x 32 x 3/16 Allen Hd. Set Screw	27	75A11	Spacer
4	71D772	Matte Panel	28	91A56	Top Shield & Lining Assembly
5	71D771	Front Panel	29	91A57	Record & Reproduce Head Final Assembly
6	61-4PB5	#4-40 x 5/16 Phillips B. H. M. S. St. N. P.	30	87A14	Control Knob With Set Screws
7	63A5	Dural Washer	31	75A37	Control Sleeve
8	63A28	Fibre Washer	32	61-4K6	4-32 x 3/8 Knurled H. M. S. Brass
9	91A49	Roller & Bearing Ass'y.			
10	63A28	Fibre Washer	33	75A16	7 1/2" Capstan 60 Cycle
11	63X29	Felt Spacer .257 I.D. x 7/16 O.D. x 1/16 Th.		75A15	15" Capstan 60 Cycle (Not Shown In Exploded View)
12	76A8	Guide Roller Shaft	34	61-4K5	4-36 x 5/16 Knurled H. M. S. Brass
13	75A11	Spacer			
14	61-2F112	Screw, Mach. 2-56 x 3/4 Fillister Hd. N. P. (4)	35	91A14	7 1/2" Pressure Roller Assembly 60 Cycle
15	91A17	Erase Head Assembly		91A15	15" Pressure Roller Assembly 60 Cycle (Not Shown In Exploded View)
16	77A25	Head Adjusting Spring (2)			
17	87A8	Knob With Set Screws (2)			
18	62-43H20	7/16-20 Hex Nut Alum.	36	91A51	Take-up Shaft & Bayonet Spindle Assembly
19	75A96	Safety Knob			
20	61-4PB5	#4-40 x 5/16 Phillips B. H. M. S. St. N. P.	37	91A52	Take-up Bearing & Housing Ass'y
			38	75A63	Take-up Hub Tube
21	63A5	Dural Washer	39	75A62	Take-up Hub Flange
22	63A28	Fibre Washer	40	63A9	Felt Washer
23	91A10	Roller & Bearing Assembly	41	91A38	Take -up Wheel & Bearing Ass'y.
24	63A28	Fibre Washer	42	63A9	Felt Washer
25	63X29	Felt Spacer .257 I. D. x 7/16	43	63A10	Brass Washer

Ref. No.	Part No.	Description
44	63A11	Rubber Washer
45	75A70	Locknut
46	61-BCS8	8 -32 x 1/2" Lg. Allen Hd. Cap. Screw
47	77A35	Spring
48	71B41	Right Half Side Panel
49		#6 Hex. Nut
50	72A42	Puck Arm Bracket
51	91A217	Lever Mounting Bracket & Stud Assembly
52	78A13	Wire Link Short
53	78A91	Lever
54	78A12	Wire Link
55	63A98	Capstan Shaft Spring Washer (2)
56	91A86	Fast Forward Puck 21/2"
57	63A19	Washer
58	67A12	Hairpin Retainer
59	67A12	Hairpin Retainer
60	63A19	Fibre Washer
61	91A740	Take-up Puck Assembly 2"
62		FeltWasher
63	63A19	Fibre Washer
64	77A4	Puck Springs (2)
65	91A739	Puck Arm & Plate Assembly - Take-up
66	75A44	Take-up Puck Plate Spacer (2)
67	91A26	Drive Puck Assembly 21/2"
68	63A19	Fibre Washer
69	67A12	Hairpin Retainer
70	91A26	Drive Puck Assembly 21/2"
71	77A4	Puck Springs (2)
72	31A23	Selenoid
73	67X7	3-32 x1/2"Drive Loc. Pin
74	63A8	Felt Washer
75	78A22	Bearing Retainer
76	74A21	Capstan Bearing
77	76A2	Pressure Arm Shaft
78		Washer
79	91A11	Pressure Arm Assembly
80	91A214	Pressure Arm Plate Assembly
81		Washer
82		"C" Washer
83	91A765	Capstan Shaft Assembly
84	78X28	Ball Bearing
85	91A216	Puck Arm & Plate Assembly-Drive
86	75A45	Puck Plate Spacer-Long
87	91A216	Puck Arm & Plate Assembly-Drive
88		Washer
89		Control Sleeve Washer (Part of Item 31)
90		Control Sleeve Nut (Part of Item 31)
91	74A66	Cam
92	61-6SS3	6-32 x 3/16 Allen Set Screw (2)
93	76A39	Switch Shaft
94	67X13	1/4" Tru-Arc Retaining Ring
95	91A31	Saftey Shaft & Pin Assembly
96		Saftey Shaft Spring
97	71B58	Left Hand Side Panel
98	75A282	Spacer, Long Rewind Motor (2)
99	91A918	Spacer, Short With Bumper, Rewind Motor (2)
100		Rewind Motor Mounting Nut (4)
101	75A283	Motor Spacer (2)
102	35B16	Rewind Motor
103	72A134	Pawl Mtg. Plate Bracket
104	71A319	Pawl Mtg. Plate
105	71A87	Pawl
106	75A85	Rewind Hub Tube
107	61-8SS3	8-32 x 3/16 Allen Hd. Set Screw
108	75A84	Rewind Hub Flange
109	63A9	Felt Washer
110	77A2	Pawl Spring
111	75A86	Ratchet
112	63A9	Felt Washer
113	63A10	Brass Washer
114	63A11	Rubber Washer
115	91A70	Locknut Assembly
116	61-8BCS8	8-32 x 1/2 Lg. Allen Hd. Cap Screw
117	91C2	Back Panel Assembly
118	75A30	Thrust Housing
119	62-25H720	1/4-20 Hex Nut x 7/16 St. N. P.
120	61A18	1/4-20 x 1/2 Set Screw-Thrust
121	35B49	Drive Motor, Hysteresis Synchronous
122	77A6	Pressure Arm Spring
123	91A30	Switch Arm & Pin Assembly
124	72A3	Switch Mounting Bracket
125	43X14	Switch D. P. S. T. (2)
126	91B736	Control Linkage Assembly

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

NEWCOMB MODEL KX-50

NEWCOMB MODEL KX-50

NEWCOMB MODEL KX-50

TRADE NAME	Newcomb Model KX-50		
MANUFACTURER	Newcomb Audio Products Co., Inc., 6824 Lexington Ave., Hollywood 38, California		
TYPE SET	AC Operated 8 Channel 50 Watt Audio Amplifier		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	2 Amp. @ 117 Volts AC (225 Watts)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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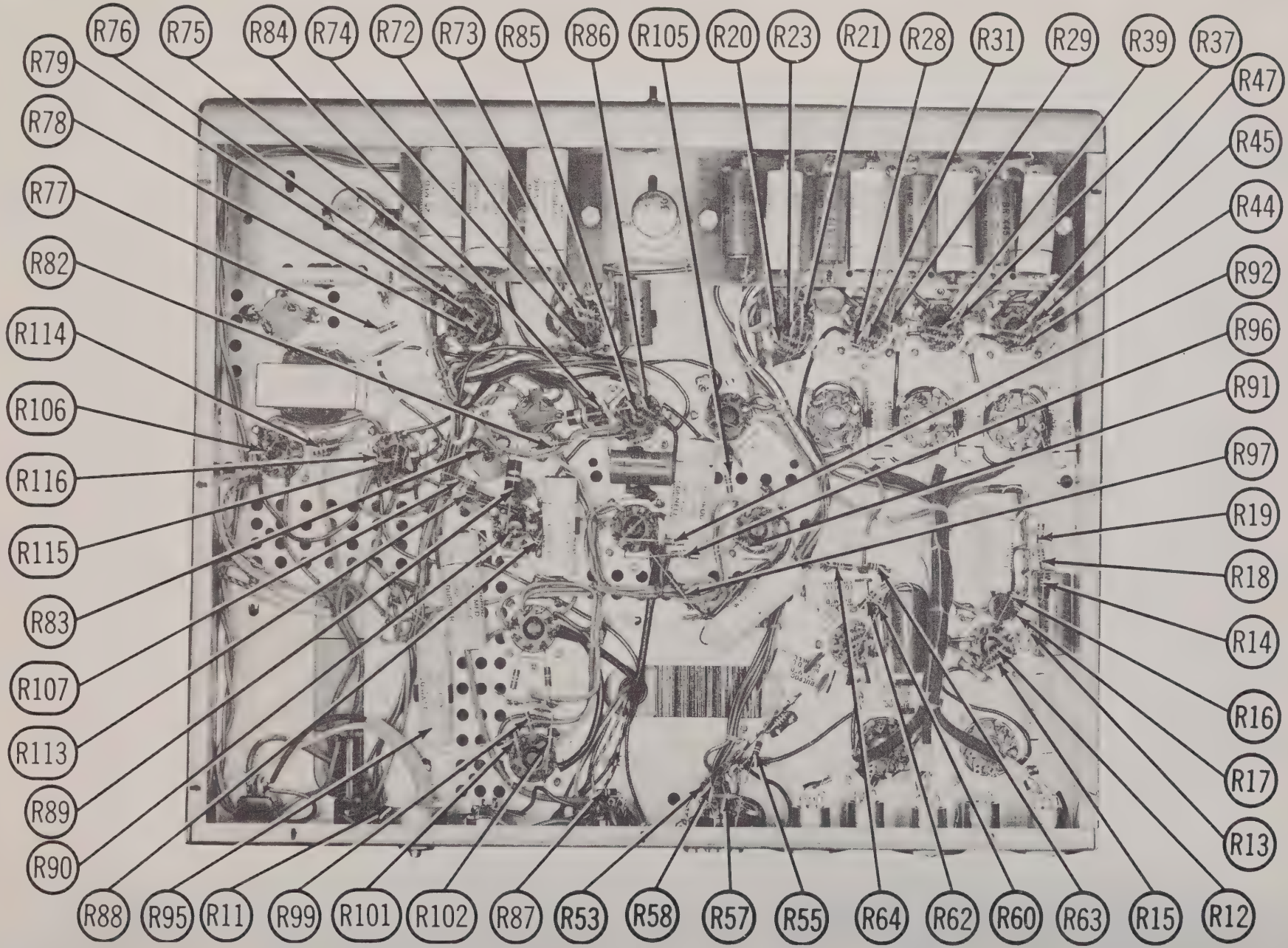
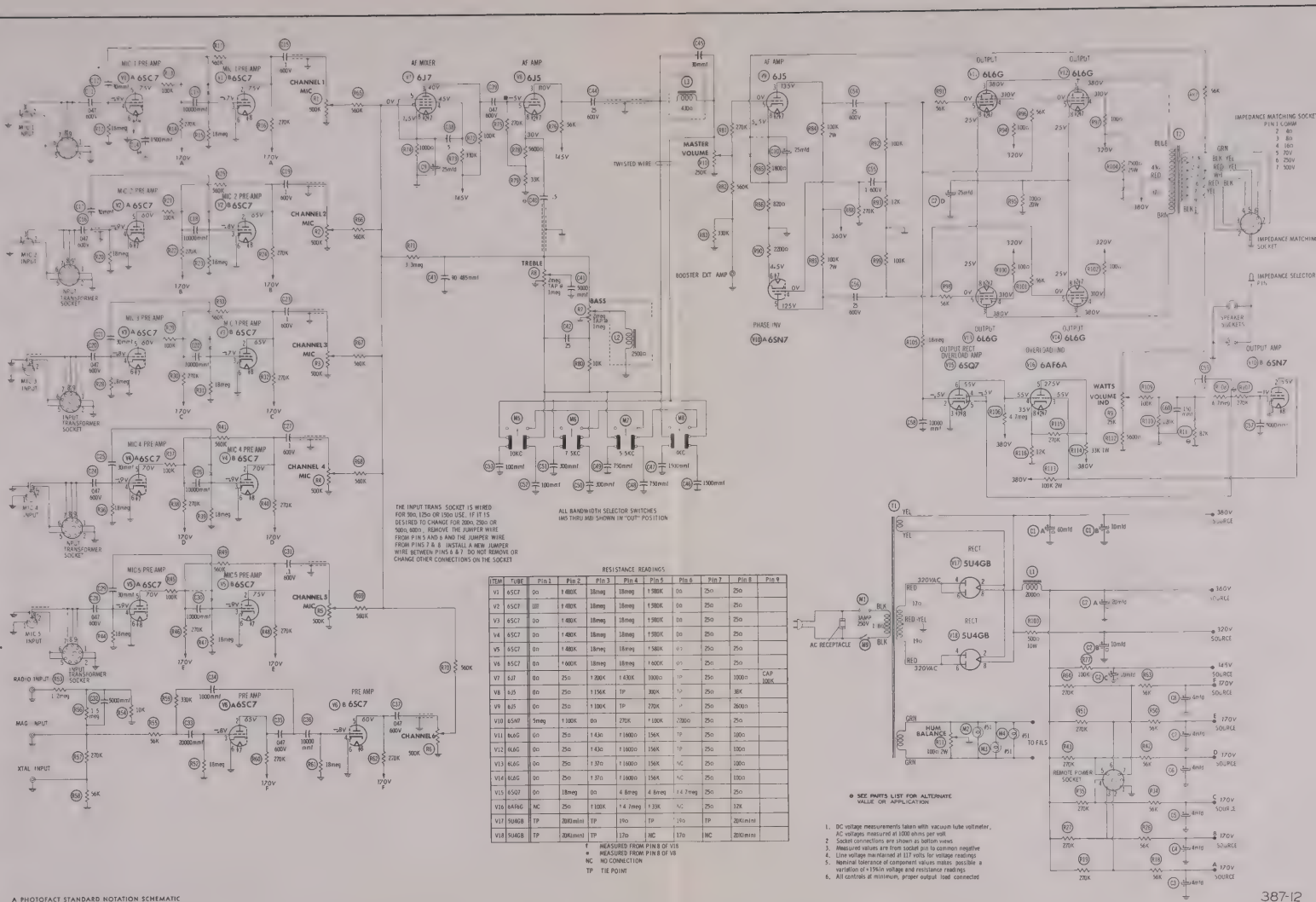


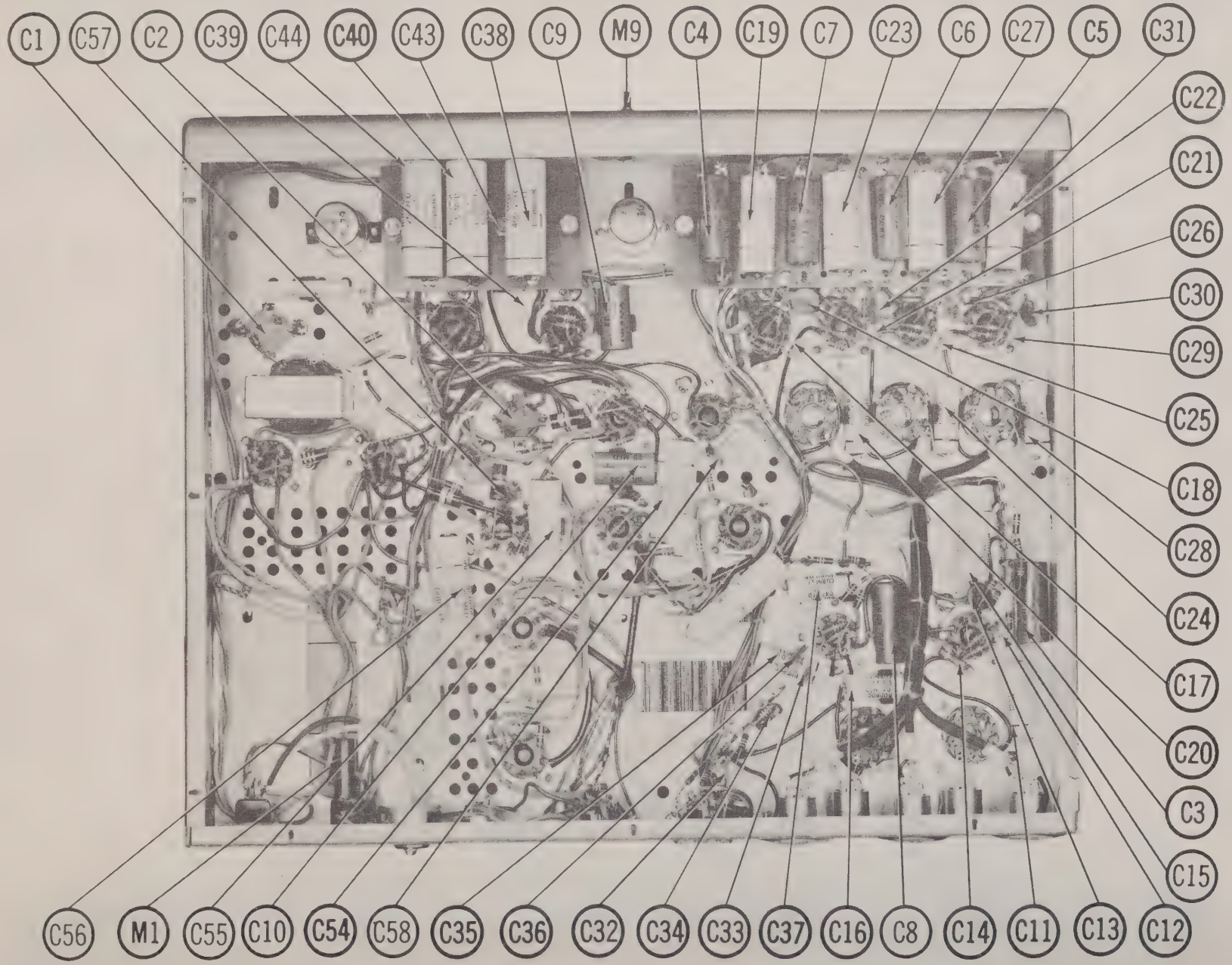
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

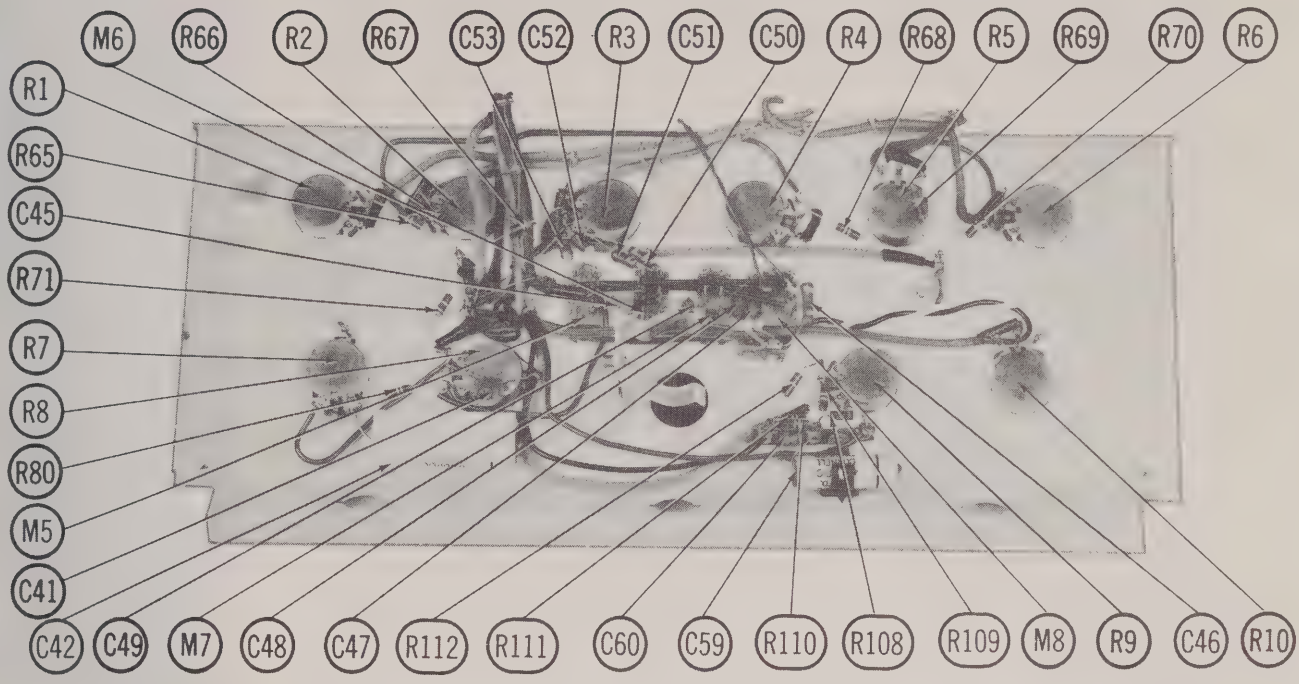
NEWCOMB
MODEL KX-50


MIC 1 PRE AMP
MIC 2 PRE AMP
MIC 3 PRE AMP
MIC 4 PRE AMP
MIC 5 PRE AMP
CHANNEL 1 MIC
CHANNEL 2 MIC
CHANNEL 3 MIC
CHANNEL 4 MIC
CHANNEL 5 MIC
CHANNEL 6
AF MIXER
AF AMP
MASTER VOLUME
TWISTED WIRE
BOOSTER EXT AMP
PHASE INV
TREBLE
BASS
OUTPUT
OUTPUT AMP
OUTPUT RECT
OVERLOAD AMP
WATTS VOLUME IND
IMPEDANCE MATCHING SOCKET
IMPEDANCE SELECTOR
SPEAKER SOCKETS
INPUT TRANSFORMER SOCKET
RADIO INPUT
MAG INPUT
XTAL INPUT
PRE AMP
REMOTE POWER SOCKET
AC RECEPTACLE
HUM BALANCE
TO FILS
RECT
THE INPUT TRANS SOCKET IS WIRED FOR 50ohms, 125ohms OR 150ohms USE. IF IT IS DESIRED TO CHANGE FOR 200ohms, 250ohms OR 500ohms, 600ohms, REMOVE THE JUMPER WIRE FROM PINS 5 AND 6 AND THE JUMPER WIRE FROM PINS 7 & 8. INSTALL A NEW JUMPER WIRE BETWEEN PINS 6 & 7. DO NOT REMOVE OR CHANGE OTHER CONNECTIONS ON THE SOCKET
ALL BANDWIDTH SELECTOR SWITCHES (MS THRU M9) SHOWN IN "OUT" POSITION
RESISTANCE READINGS
ITEM TUBE Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6 Pin 7 Pin 8 Pin 9
V1 6SC7 0ohms 1.480K 18meg 18meg 1.580K 0ohms 250 250
V2 6SC7 0ohms 1.480K 18meg 18meg 1.580K 0ohms 250 250
V3 6SC7 0ohms 1.480K 18meg 18meg 1.580K 0ohms 250 250
V4 6SC7 0ohms 1.480K 18meg 18meg 1.580K 0ohms 250 250
V5 6SC7 0ohms 1.480K 18meg 18meg 1.580K 0ohms 250 250
V6 6SC7 0ohms 1.600K 18meg 18meg 1.600K 0ohms 250 250
V7 6J7 0ohms 250 1.200K 1.630K 100Ohms 150 250 100Ohms CAP 100K
V8 6J5 0ohms 250 1.156K TP 300K 150 250 38K
V9 6J5 0ohms 250 1.100K TP 270K 150 250 260Ohms
V10 6SN7 5meg 1.100K 0ohms 270K 1.100K 2000hms 250 250
V11 6L6G 0ohms 250 1.43K 1.16000hms 156K TP 250 100Ohms
V12 6L6G 0ohms 250 1.43K 1.16000hms 156K TP 250 100Ohms
V13 6L6G 0ohms 250 1.370 1.16000hms 156K NC 250 100Ohms
V14 6L6G 0ohms 250 1.370 1.16000hms 156K NC 250 100Ohms
V15 6SQ7 0ohms 18meg 0ohms 4.8meg 4.8meg 114.7meg 250 250
V16 6AF6G NC 250 1.100K 1.4.7meg 1.33K NC 250 12K
V17 5U4GB TP 20KOmini TP 190 TP 190 TP 20KOmini
V18 5U4GB TP 20KOmini TP 170 NC 170 NC 20KOmini
f MEASURED FROM PIN 8 OF V16
* MEASURED FROM PIN 8 OF V8
NC NO CONNECTION
TP TIE POINT
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of +15% in voltage and resistance readings
6. All controls at minimum, proper output load connected
387-12

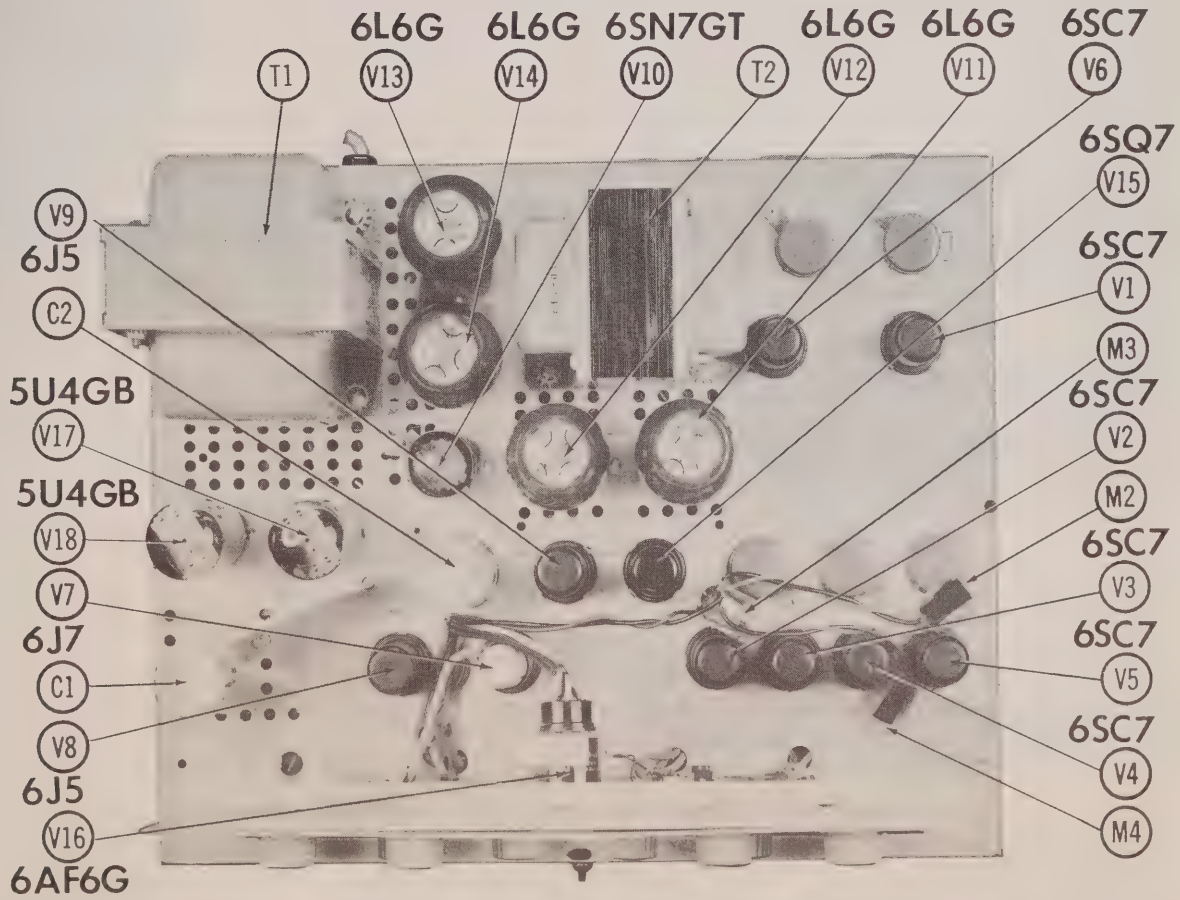
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CONTROL PANEL REAR



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NEWCOMB PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 1 (Mic)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 2 (Mic)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 3 (Mic)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 4 (Mic)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 5 (Mic)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R6A	500K	½	RV-41K	B-60	A47-500K-Z	Q13-133	U48	Channel 6 (Phono)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R7A	2meg	½	RV-59K	BT-78	A47F3-2meg	Q18-139X	UT-451	Bass, Tap ④ 1meg
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R8A	2meg	½	RV-59K	BT-78	A47F3-2meg	Q18-139X	UT-451	Treble, Tap ③ 1meg
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R9A	25K	½	RV-37K	B-26	A47-25K-S	Q11-120	U29	Watts (Volume Indicator)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R10A	250K	½	RV-61K	B-51	A47-250K-K	Q13-130	U44	Master (Volume)
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R11A	100Ω	2	RV-50	WN-101	A43-100	WPK100	R100-L	Hum Balance (Wirewound)
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		NEWCOMB PART No.	NOTES
	OHMS	WATT		
R12	18meg		RR-140	
R13	100K		RR-27	
R14	270K		RR-31	
R15	18meg		RR-140	
R16	270K		RR-31	
R17	560K		RR-34	
R18	56K		RR-25	
R19	270K		RR-31	
R20	18meg		RR-140	
R21	100K		RR-27	
R22	270K		RR-31	
R23	18meg		RR-140	
R24	270K		RR-31	
R25	560K		RR-34	
R26	56K		RR-25	
R27	270K		RR-31	
R28	18meg		RR-140	
R29	100K		RR-27	

ITEM No.	RATING		NEWCOMB PART No.	NOTES
	OHMS	WATT		
R30	270K		RR-31	
R31	18meg		RR-140	
R32	270K		RR-31	
R33	560K		RR-34	
R34	56K		RR-25	
R35	270K		RR-31	
R36	18meg		RR-140	
R37	100K		RR-27	
R38	270K		RR-31	
R39	18meg		RR-140	
R40	270K		RR-31	
R41	560K		RR-34	
R42	56K		RR-25	
R43	270K		RR-31	
R44	18meg		RR-140	
R45	100K		RR-27	
R46	270K		RR-31	
R47	18meg		RR-140	

PARTS LIST AND DESCRIPTIONS (Continued)

FUSE

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			NEWCOMB PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V			312003. (3AG 3A 250V)	341001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	NEWCOMB PART No.	NOTES
M2	Pilot Light		#51
M3	Pilot Light		#51
M4	Pilot Light		#51
M5	Switch	SY-73	Bandwidth Selector (Slide Type SPDT)
M6	Switch	SY-73	Bandwidth Selector (Slide Type SPDT)
M7	Switch	SY-73	Bandwidth Selector (Slide Type SPDT)
M8	Switch	SY-73	Bandwidth Selector (Slide Type SPDT)
M9	Switch	SY-63	Power-On-Off (Toggle Type)

H. H. BLANKENSHIP,
3924 MEADE St.
DENVER, COLORADO

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KA-15-K	Ivory (10 Used)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	NEWCOMB PART No.	NOTES
R48	270K		RR-31	
R49	560K		RR-34	
R50	56K		RR-25	
R51	270K		RR-31	
R52	18meg		RR-140	
R53	1.2meg		RR-38	
R54	10K		RR-18	
R55	56K		RR-25	
R56	1.5meg		RR-39	
R57	270K		RR-31	
R58	56K		RR-25	
R59	330K		RR-32	
R60	270K		RR-31	
R61	18meg		RR-140	
R62	270K		RR-31	
R63	56K		RR-25	
R64	270K		RR-31	
R65	560K		RR-34	
R66	560K		RR-34	
R67	560K		RR-34	
R68	560K		RR-34	
R69	560K		RR-34	
R70	560K		RR-34	
R71	3.3meg		RR-42	
R72	100K		RR-27	
R73	330K		RR-32	
R74	1000Ω		RR-6	
R75	270K		RR-31	
R76	56K		RR-25	
R77	100K		RR-27	
R78	5600Ω		RR-15	
R79	33K		RR-23	
R80	10K		RR-18	
R81	270K		RR-31	
R82	560K		RR-34	

ITEM No.	RATING OHMS	RATING WATT	NEWCOMB PART No.	NOTES
R83	330K		RR-32	
R84	100K	2	RR-136	
R85	1800Ω		RR-9	
R86	820Ω		RR-5	
R87	56K		RR-25	
R88	270K		RR-31	
R89	100K	2	RR-136	
R90	2200Ω		RR-10	
R91	56K		RR-25	
R92	100K		RR-27	
R93	12K		RR-19	
R94	100Ω		RR-1	
R95	100Ω	20	RR-107	
R96	56K		RR-25	
R97	100Ω		RR-1	
R98	56K		RR-25	
R99	100K		RR-27	
R100	100Ω		RR-1	
R101	56K		RR-25	
R102	100Ω		RR-1	
R103	1500Ω	10	RR-101	
R104	7500Ω	25	RR-152	
R105	18meg		RR-140	
R106	4.7meg		RR-43	
R107	270K		RR-31	Note 1
R108	4.7meg		RR-43	
R109	100K		RR-27	
R110	120K		RR-28	
R111	82K			Note 2
R112	5600Ω		RR-15	
R113	100K	2	RR-136	
R114	33K	1	RR-139	
R115	270K		RR-31	
R116	12K		RR-19	

Note 1. Some versions may use 2.7meg in this application (Part #RR-41).
Note 2. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 2A	700VCT @ .260A	5V 6A	6.3VCT @ 8A	TR-139				26R15 ①	

① Use original shields and parallel and phase 5V windings.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	2500Ω CT	500Ω Tap @ 250Ω, 70V, 16Ω, 8Ω, 4Ω	TR-140						

CHOKES

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA NEWCOMB PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.011A	2000Ω	80 Hy.	TC-5 ①					
L2	0A	2500Ω	23 Hy.	TC-29 ②					
L3	0A	430Ω	3.2 Hy.	TC-30 ③					

① Filter Choke
② Low Frequency Tone Choke
③ High Frequency Tone Choke

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Mic 1 Preamplifier	6SC7	
V2	Mic 2 Preamplifier	6SC6	
V3	Mic 3 Preamplifier	6SC7	
V4	Mic 4 Preamplifier	6SC7	
V5	Mic 5 Preamplifier	6SC7	
V6	Radio-Phono Preamp.	6SC7	
V7	AF Mixer	6J7	
V8	AF Amplifier	6J5	
V9	AF Amplifier	6J5	
V10	Phase Inv. - Output Amp.	6SN7	
V11	Output	6L6G	
V12	Output	6L6G	
V13	Output	6L6G	
V14	Output	6L6G	
V15	Output Rect. - Overload Amp	6SQ7	
V16	Overload Indicator	6AF6G	
V17	Rectifier	5U4GB	
V18	Rectifier	5U4GB	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA NEWCOMB PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲60	500	CE-33	AFH3-53				T-205	R2409 *
B	▲10	475						MT-4710	
C2A	▲20	475	CE-30	AFH4-19-10		FP474.5		Q-070	R2405 *
B	■10	475				TC36		MT-0525	
C	▲ 10	475							
D	25	50							
C3	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C4	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C5	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C6	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C7	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C8	4	450	CE-1	PRS450V4	BR445	TC70	TD-4-450	MT-4504	TVA-1702
C9	25	50	CE-9	PRS50V25	BBR25-50	TC36	TD-25-50	MT-0525	TVA-1306
C10	25	50	CE-9	PRS50V25	BBR25-50	TC36	TD-25-50	MT-0525	TVA-1306

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA NEWCOMB PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C11	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C12	30		CM-16	SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C13	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C14	1500		CM-27	SI 1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	①
C15	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C16	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C17	30		CM-16	SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C18	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C19	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA NEWCOMB PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C20	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C21	30		CM-16	SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C22	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C23	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C24	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C25	30		CM-16	SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C26	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C27	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C28	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C29	30		CM-16	SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C30	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C31	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C32	5000		CM-34	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C33	20000		CM-35	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C34	1000		CM-38	SI 1000	D6-102	LT6D1	GP-1000	UC521	5GA-D1	
C35	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C36	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C37	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C38	.5	400	CP-74	P488N-5		CUB4P5		GEM-405	4TM-P5	
C39	.047	600	CP-49	P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	
C40	.5	400	CP-74	P488N-5		CUB4P5		GEM-405	4TM-P5	②
C41	5000		CM-34	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C42	.25	400	CP-65	P488N-25		CUB4P25		GEM-4025	4TM-P25	
C43	90-485									
C44	.25	600	CP-53	P688N-25		CUB6P25		GEM-6025	6TM-P25	
C45	30		CM-16	SI 30	D6300	LT6Q3	GP-30	UC-543	5GA-Q3	
C46	1500		CM-27	SI 1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C47	1500		CM-27	SI 1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C48	750		CM-24	SI 750	D6-751	LT6T75	GP-750	UC-5375	5GA-T75	
C49	750		CM-24	SI 750	D6-751	LT6T75	GP-750	UC-5375	5GA-T75	
C50	300		CM-15	SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C51	300		CM-15	SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C52	100		CM-14	SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C53	100		CM-14	SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C54	.25	600	CP-53	P688N-25		CUB6P25		GEM-6025	6TM-P25	
C55	.1	600	CP-52	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C56	.25	600	CP-53	P688N-25		CUB6P25		GEM-6025	6TM-P25	
C57	5000		CM-34	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C58	10000		CM-32	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C59	.1	400	CP-51	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C60	150		CM-23	SI 150	D6-151	LT6T15	GP-150	UC-5315	5GA-T15	

① Not used in some versions.
② Some versions use .25mfd 400V in this application (Part #CP-65).

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RCA VICTOR
MODEL SHF-5 (Ch. RS-151B)

RCA VICTOR
MODEL SHF-5 (Ch. RS-151B)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RCA VICTOR
MODEL SHF-5 (Ch. RS-151B)

TRADE NAME	RCA Victor Model SHF-5 (Ch. RS-151B)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N.J.
TYPE SET	AC Operated Phono Amplifier with 4 Speed Automatic Record Changer
TUBES (Five)	Types 6CG7 Preamplifier, 6CG7 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .60 Amp. @117 Volts AC (63Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER MODEL 205C-2 SEE RCA MODEL 205 SERIES - PHOTOFACT SET 358 FOLDER 10

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL SHF-5 (Ch. RS-151B)

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamplifier	6CG7	
V2	AF Amp-Phase Inv.	6CG7	
V3	Output	6V6GT	
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲35	400	101414	AFH4-78-10	D0650	FP429	TMQ-99	Q-385	R2589 *
B	■35	400							
C	▲10	350							
D	20	25							
C2A	▲20	400	101357	AFH4-76	D0624	FP396.1 TC22		Q-305 MMT-0210	R2505 *
B	■20	400							
C	▲40	25							
D	10	25							
C3	8	10VAC	100509	PRS-AC10V8	BBR16-90 † BBR16-90	TC108	TD-16-150 † TD-16-150	MT-1516 † MT-1516	R2201 *

† Connect Negative Leads Together
* Non Catalog Item

FIXED CAPACITORS

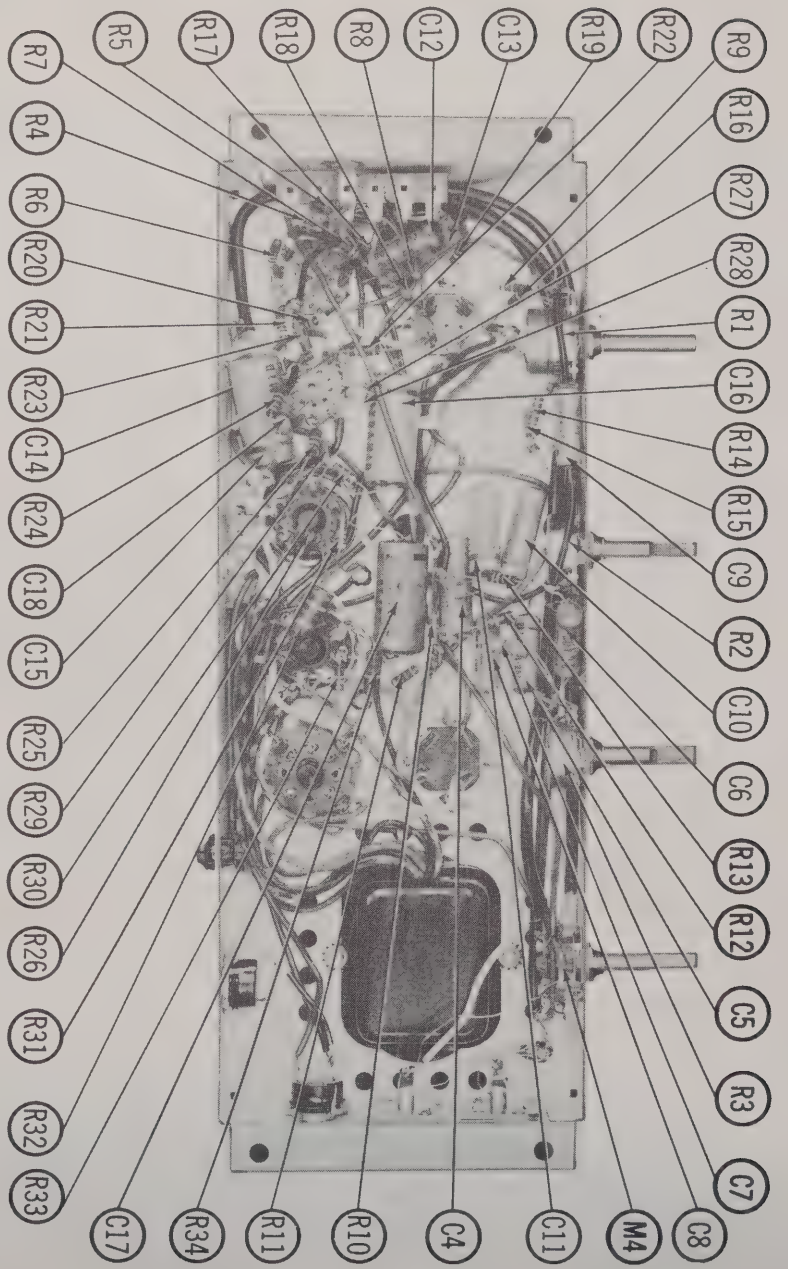
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	.047	400	73553							10%
C5	.001	600	75249					GEM-1621		10%
C6	.01	200	73561							10%
C7	470		75198	NPO-SI470	D6-471	5R5T47	ED-470		MS-347	10%
C8	.0047	400	73920					GEM-16247		10%
C9	.0068	400	73789					GEM-16268		10%
C10	.022	200	79343							10%
C11	.047	200	73558							10%
C12	.0033	400	73795					GEM-16233		10%
C13	.047	400	73553							10%
C14	470		75198	NPO-SI470	D6-471	5R5T47	ED-470		MS-347	10%
C15	.27	400	78571					GEM-4025		10%
C16	.27	400	78571					GEM-4025		10%
C17	.27	400	78571					GEM-4025		10%
C18	220		77460	NPO-SI220	D6-221	L10T22	ED-220		MS-322	10%

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	104535	BT-160		Q18-133XX	UDT-283	Loudness, Tap@100 & 200K
B	Switch			KB-1		76-1	US-26	
R2A	500K	½	104533	B-60	A47-500K-Z	Q13-133	U48	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	500K	½	104534	B-59	A47-500K-S	Q11-133	U50	Treble
B	Switch			Not Req.	FS-3	Not Req.	Not Req.	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R4	4700Ω		502247	
R5	2.7meg		72788	
R6	33K		502333	
R7	82K		502382	
R8	15K		502315	
R9	3300Ω		502233	
R10	82K		502382	
R11	8200Ω		502282	
R12	220K		502422	
R13	22K		502322	
R14	22K		502322	
R15	8200Ω		502282	
R16	220K		502422	
R17	120K		502412	
R18	10K		502310	
R19	22K		502322	
R20	3300Ω		502233	
R21	470K		502447	
R22	82K		502382	
R23	5600Ω		502256	
R24	8200Ω		502282	
R25	56K		502356	
R26	22K		502322	
R27	27K		502327	
R28	4700Ω		502247	
R29	2700Ω		502227	
R30	22K		502322	
R31	470K		502447	
R32	270Ω	2	522127	
R33	470K		502447	
R34	2200Ω	1		Note 1

Note 1. Some versions use 2 W in this application (Part #522222)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .60A	600VCT @ .080A	5VAC @ 2A	6.3VAC @ 2.2A	104587				22R02	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	7100Ω CT	3-4Ω	103914						

SPEAKER

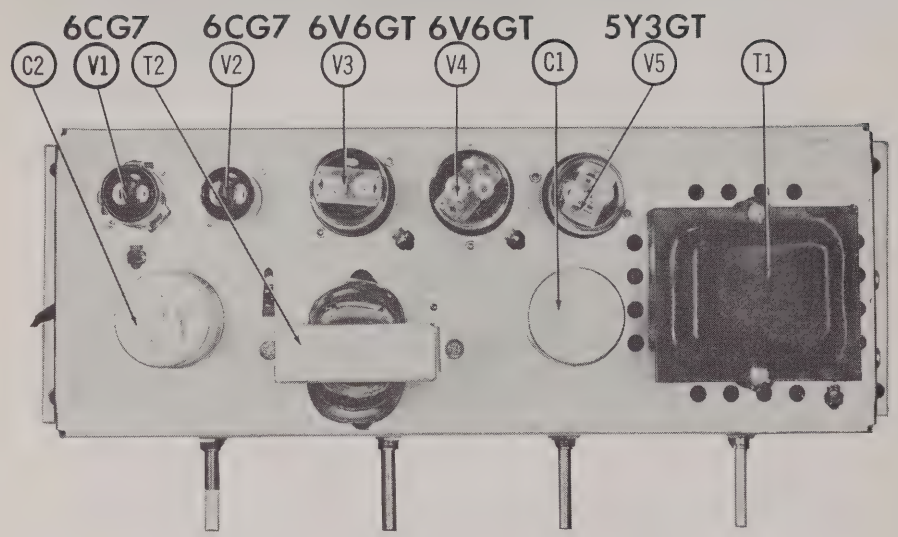
ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	100897 ①	12A10PA ①	① Parallel and Phase
SP2	12"	PM	6-8Ω	100897 ①	12A10PA ①	
SP3	3½"	PM	6-8Ω	100465 ①	3A15TZ6.6①	
SP4	3½"	PM	6-8Ω	100465 ①	3A15TZ6.6①	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	100653	55-T or 81-TB	GD-J	56	PT-2	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

CHASSIS—TOP VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA RCA Victor PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	78827	† S-66 or † ♦ S-66SD or ♦ S-66D	† W75TPS or † ♦ W75DS or ♦ W75TPD	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M3	Pilot Lamp	11891	#44
M4	Switch	104532	Function (Rotary Wafer Type)
M5	Motor	102541	Phono

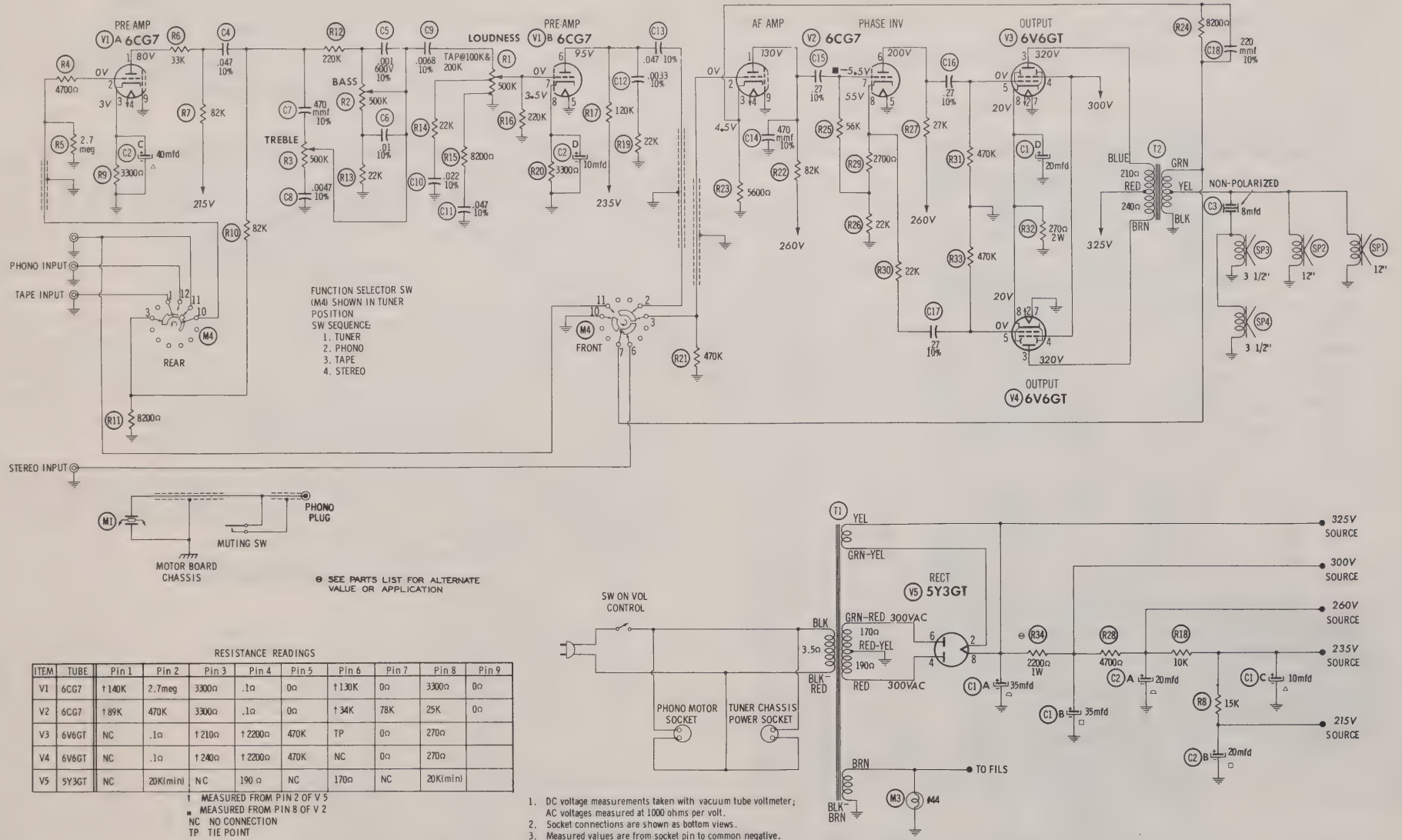
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	104536	On-Off-Volume
Knob	104127	Bass & Treble
Knob	104537	Function Switch
Escutcheon	104538	Control Knob

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CG7	†140K	2.7meg	3300Ω	.1Ω	0Ω	†130K	0Ω	3300Ω	0Ω
V2	6CG7	†89K	470K	3300Ω	.1Ω	0Ω	†34K	78K	25K	0Ω
V3	6V6GT	NC	.1Ω	†210Ω	†2200Ω	470K	TP	0Ω	270Ω	
V4	6V6GT	NC	.1Ω	†240Ω	†2200Ω	470K	NC	0Ω	270Ω	
V5	5Y3GT	NC	20K(min)	NC	190Ω	NC	170Ω	NC	20K(min)	

† MEASURED FROM PIN 2 OF V 5
▪ MEASURED FROM PIN 8 OF V 2
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODEL 7228 (Ch. 528.48700, 528.48701)

SILVERTONE MODEL 7228 (Ch. 528.48700, 528.48701)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

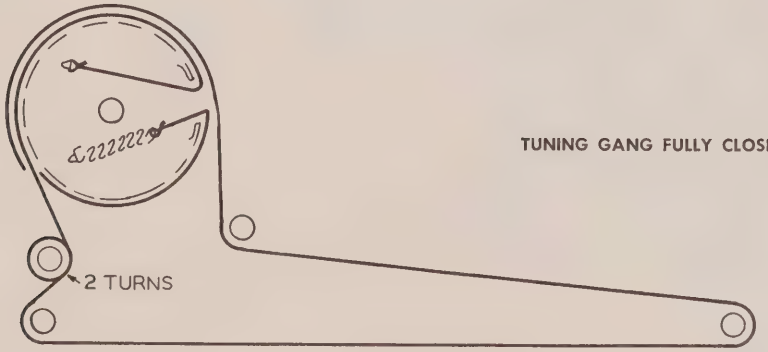
SILVERTONE MODEL 7228 (Ch. 528.48700, 528.48701)

TRADE NAME	Silvertone Model 7228 (Ch. 528.48700, 528.48701)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	9 Volts DC — RATING 10MA @ 9 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to base of X1. Low side to B-.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. Maintain 0.4V reading on meter.
2.	"	"	1630KC	"	"	A5	"
3.		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Rock tuning gang while making adjustment.



TUNING GANG FULLY CLOSED

DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H230

FOLDER 14

PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 7228 (CH. 528.48700)

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N94	Converter	2N439		2N94	
X2	2N94	1st. IF Amplifier	2N439		2N94	
X3	2N94	2nd. IF Amplifier	2N439		2N94	
X4	2N35	Driver	2N439		2N35	
X5	2N214	Output	2N439		2N214	
X6	2N214	Output	2N439		2N214	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	15	18-28-5	XPP15V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C2	6	15	18-27-5	XPP15V6	NL5-25	TT25X5	ML6-15	MMT-1505	TVA-1203
C3	50	15	18-28-5	XPP15V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C4	50	15	18-28-5	XPP15V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C5	50	15	18-28-5	XPP15V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C7	1000		15-10216	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C8	5000		15-50216	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C9	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C10	22		15-22011	N750-SI 22	TCN-22	C10Q22U	TC7-22		5TCU-Q22	① N750 10%
C11	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C12	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C13	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C14	3.3		20-45-0	NPO-SI 3.3	TCZ-3R3	C10V33C	TCO-3.3	ZT-5533	5TCCB-V33	
C15	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C16	20000		15-20317	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C17	20000		20-35-0	BPD-02	DD-203	BYB6S2	ED-02		5HK-S2	
C18	.001	600	16-10253	P688N-001	D6-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C19	.05	200	16-50323	P288N-05	DF-503	CUB2S5		GEM-415	2TM-S5	

① Some versions may use 27MMF (Part #15-27011) in this application.

CONTROLS

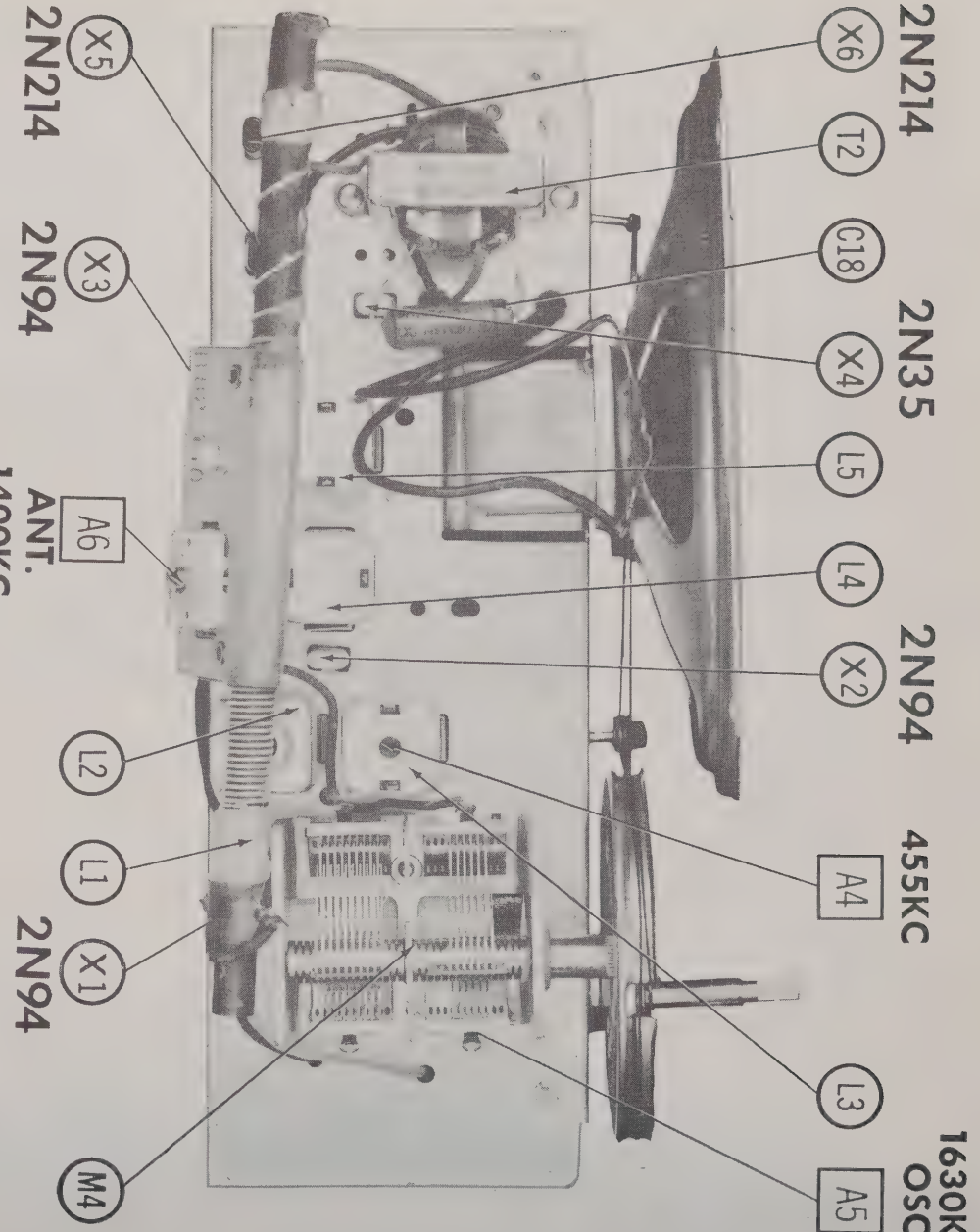
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2500Ω	½	24-255	AB-7	A47-2500-S	Q11-112	U8	Volume
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
C	Switch			KB-1	SWE-12	76-1	US-26	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		SILVERTONE PART No.	NOTES
	OHMS	WATT		
R2	3900Ω		60-39201	
R3	82K		60-82301	
R4	100K		60-10401	Note 1
R5	4700Ω		60 -47201	Note 2
R6	1500Ω		60-15201	
R7	100K		60-10401	
R8	3300Ω		60-33201	
R9	68K		60-68301	Note 1
R10	3900Ω		60-39201	Note 3
R11	470Ω		60-47101	
R12	3900Ω		60-39201	
R13	2200Ω		60-22201	
R14	27K		60-27301	
R15	1000Ω		60-10201	
R16	39K		60-39301	
R17	470Ω		60-47101	
R18	2200Ω		60-22201	
R19	22K		60-22301	
R20	470Ω		60-47101	
R21	4700Ω		60-47201	
R22	100Ω		60-10101	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R23	10Ω		60-10001	
R24	220Ω		60-22101	

Note 1. Not used in some versions.
Note 2. Chassis 528.48700 may use 5600Ω (Part #60-56201) in this application.
Some chassis may use 5600Ω and 15K in parallel. Mfgr recommends replacement with 4700Ω.
Note 3. Some versions may use a 1200Ω (Part #60-12201) in this application.
Note 4. Some versions may use a 4700Ω (Part #60-47201) in this application.

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2.5	1	80-406						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	945Ω CT	3-4Ω	80-405				TR-66 ①		① Do not use center tap on primary.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	79-480	46A15	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Sitck	82-110				Note 1
L2	Osc. Coil	10-21-4				
L3	1st. IF	10-59-2				
L4	2nd. IF	10-53-2				Note 2
L5	3rd. IF	10-53-2				

Note 1. Includes trimmer part #19-143-0.
Note 2. Chassis 528.48700 may use part #10-52-2.

BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	RAY-O-VAC "A"	RAY-O-VAC "B"	NOTES
M1	9V	6420	D6P1		2506				1601		

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA SILVERTONE PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	1N60		1N60		AVC Diode
M3	1N60		1N60		Diode Detector

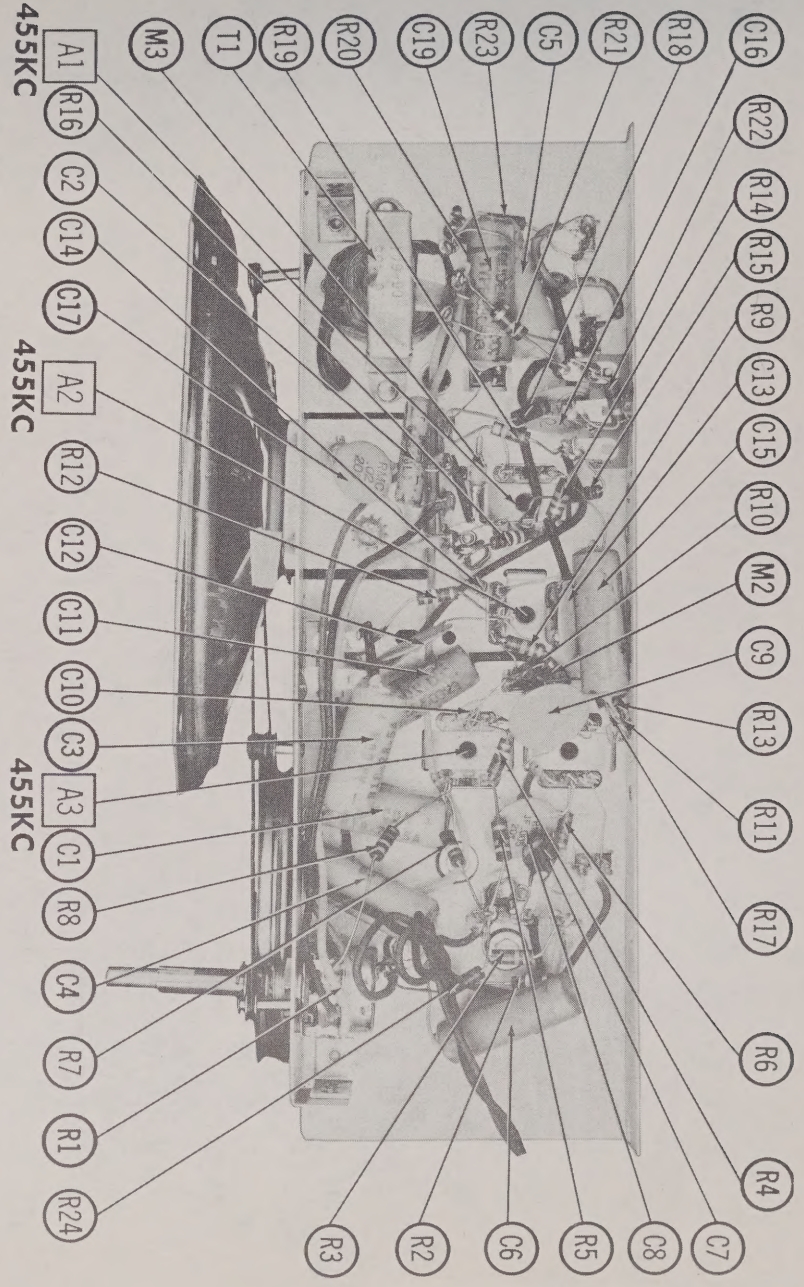
MISCELLANEOUS

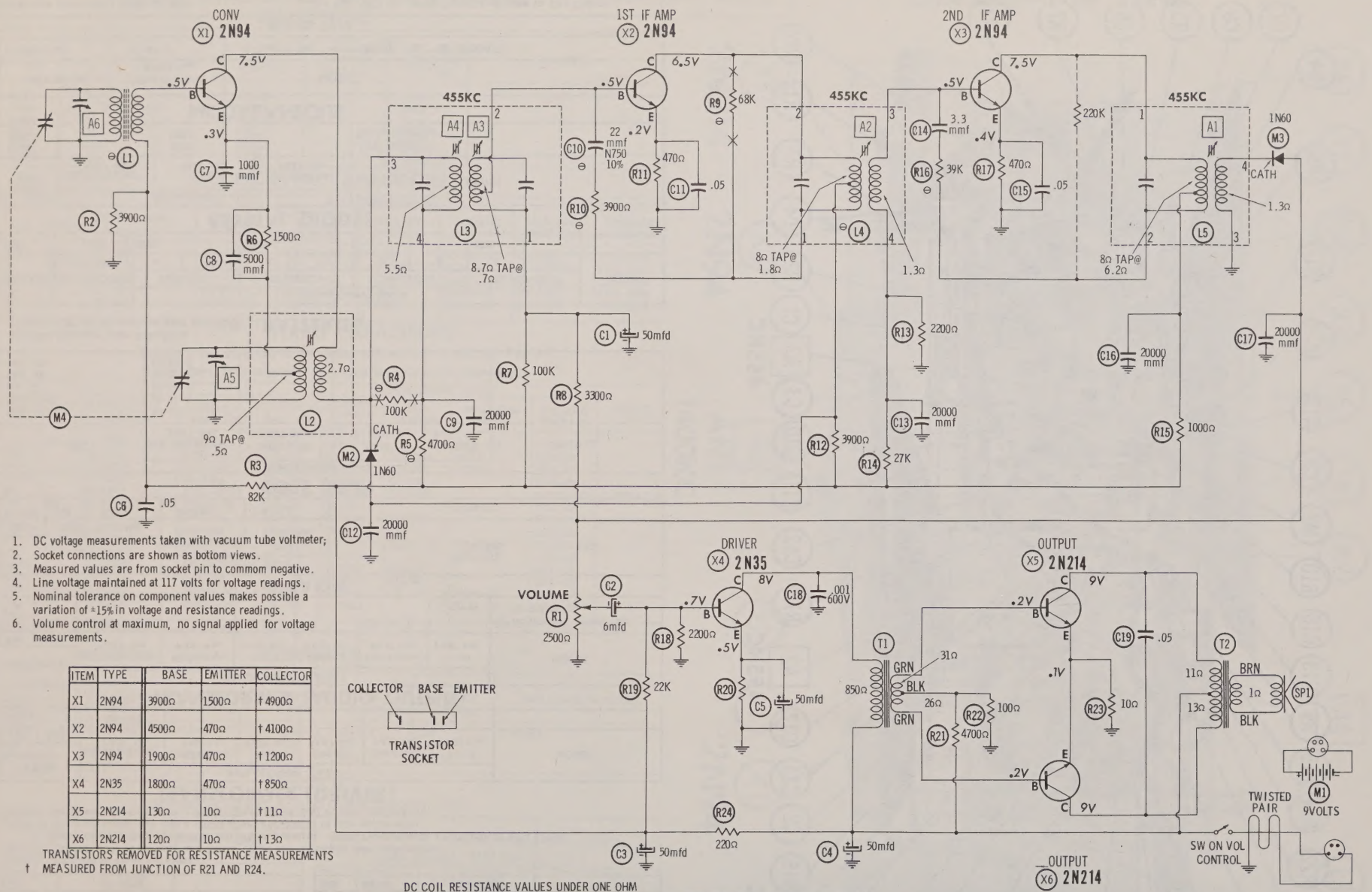
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap.	19-48-2	2 Gang (Ant. 40-340MMF, Osc. 25-140MMF)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter;
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

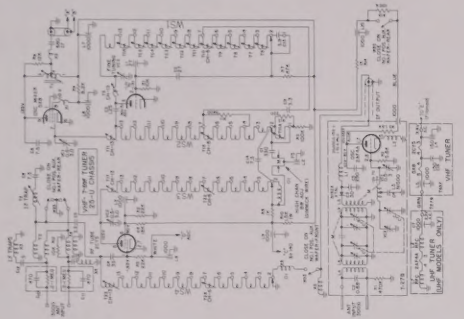
ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N94	3900Ω	1500Ω	† 4900Ω
X2	2N94	4500Ω	470Ω	† 4100Ω
X3	2N94	1900Ω	470Ω	† 1200Ω
X4	2N35	1800Ω	470Ω	† 850Ω
X5	2N214	130Ω	10Ω	† 11Ω
X6	2N214	120Ω	10Ω	† 13Ω

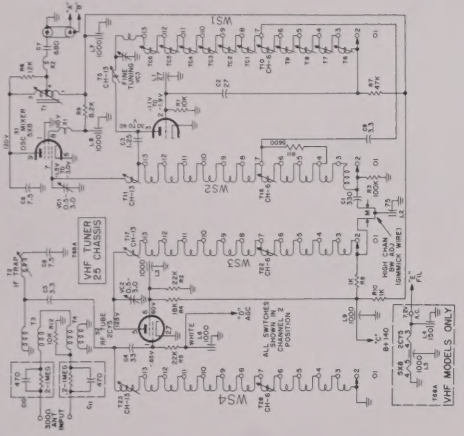
TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS
† MEASURED FROM JUNCTION OF R21 AND R24.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

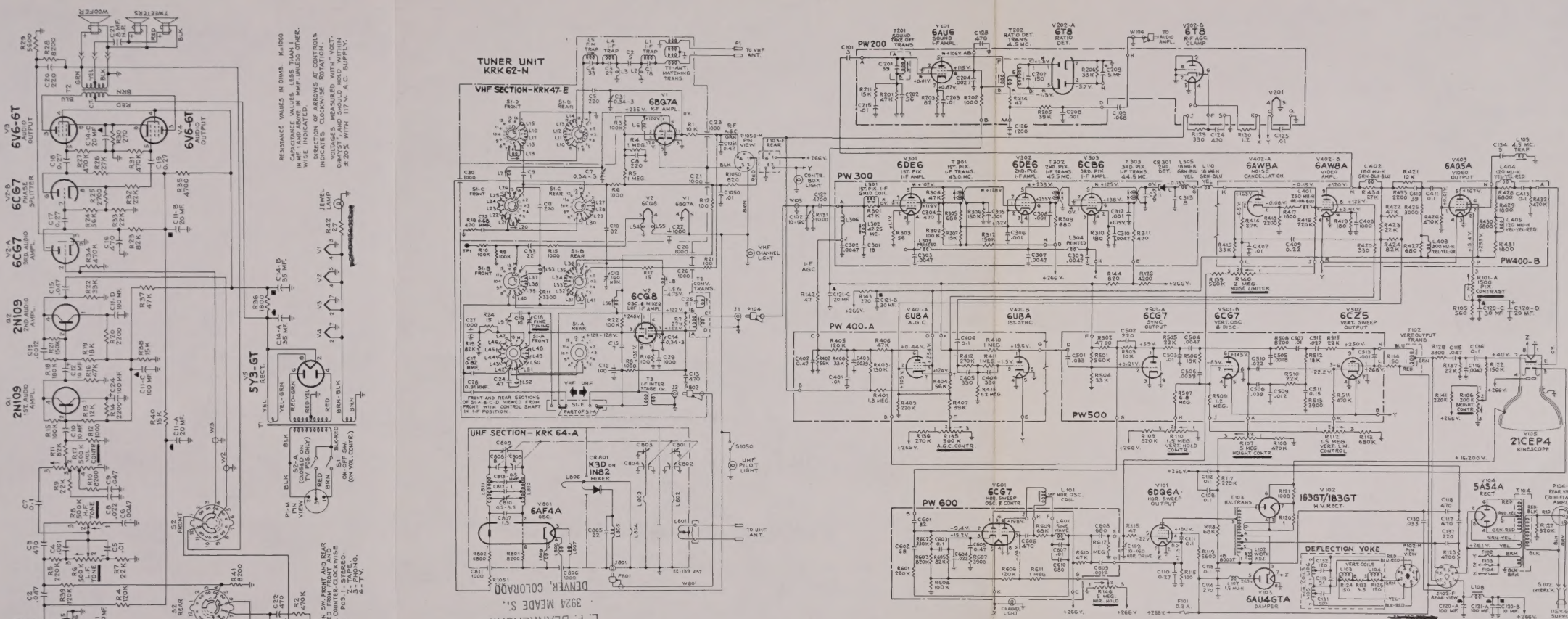




PHILCO MODELS	CHASSIS
F3042F, G	8H25
F3044A	"
F3202C	"
F3204B, L, M	"
UF3042F, G	8H25U
UF3044A	"
UF3202C	"
UF3204B, L, M	"

SCHEMATIC COURTESY OF PHILCO CORPORATION

NOTES: All capacitor values greater than 1 are in MMF unless otherwise noted.
All capacitor values less than 1 are in MFD unless otherwise noted.
All resistors are ½ watt, 10%, carbon unless otherwise noted.
Arrow through control indicates clockwise rotation.
Voltages are DC from point shown to chassis unless otherwise noted.
Voltages were read using a 20,000 ohms/volt meter. Voltages were taken with no signal. The receiver was adjusted for a good quality picture; i.e., normal contrast, brightness, width, height, vertical lin. and sound, picture in sync, then removed signal.
* Indicates a voltage dependent upon signal. See Figures 16 and 17 on page 12. Waveform measurement conditions given on page 7.
Tuner schematics appear on pages 4 & 5.
Run change information on page 9.
⊕ Focus voltage optional for best focus.



RCA MODELS	CHASSIS		
21DF8635, U	KCS108K, L & CTP5C	21DF8637, U	KCS108K, L & CTP5C
21DF8636, U	"	21DF8646, U	"
		21DF8649, U	"

SCHEMATIC COURTESY OF RADIO CORPORATION OF AMERICA